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AUTOMOTIVE INDUSTRIES
The AUTOMOBILE

VOL. XLI NEW YORK—THURSDAY, OCTOBER 9, 1919—CHICAGO No. 15

Canada's Plan for Control and Development of Aeronautics

Canada, Our Neighbor on the North, Has Seen the Future of Aircraft and Is Establishing a Federal Control. The Plan Is Printed Here with a View of Suggesting to the Interested American Public and Those Who Should Be Interested What Our Neighbors Are Doing and What We Should Do in Order That We Can Meet Them on Even Terms. The Simplicity and Elasticity of the Canadian Plan Must Have an Appeal

By Allen Sinsheimer

CANADA is establishing an Air Board for the control of aeronautics, and the plan under contemplation is intensely interesting to those who have studied the various plans suggested for such a department in our government.

In presenting the original draft of this plan, especial attention is called to the outlines of the "Duties of the Air Board" and to the "Powers of the Air Board to make regulations with the approval of the Governor in Council."

These outlines should effectually answer the criticisms raised from certain quarters in this country that a Department of Aeronautics is merely a scheme of a few enthusiasts. It will be noted that this draft for the control of aircraft in Canada has been made following the adoption of a department scheme in the United Kingdom, which was outlined in Automotive Industries (issue of Aug. 28) and must appeal because of the simplicity of the plan, as well as the direct statement made for its work. The elasticity of the Canadian plan also should appeal to those who are thinking of the future.

The plan as drafted follows:

An Act to authorize the appointment of an Air Board for the control of aeronautics.

His Majesty, by and with the advice and consent of the Senate and House of Commons of Canada, enacts as follows:

Short Title

(1) This Act may be cited as the Air Board Act.

Air Board

(2) (a) There shall be a Board on Aeronautics, hereinafter called the Air Board, which shall

consist of not less than five, and not more than seven members, who shall be appointed by the Governor in Council.

Chairman and Vice-Chairman

(b) The Governor in Council shall appoint a member of the Air Board who is one of the ministers of the Crown to be Chairman of the Board, and shall appoint one of the other members of the Board to be Vice-Chairman.

Representatives of the Army and Navy

(c) One member of the Air Board shall be appointed as representative of the department of Militia and Defense and one as a representative of the Department of Naval Service.

Term of Office

(d) The members of the Air Board shall be appointed for a term of three years, and shall be eligible for re-appointment.

Salaries

(e) The members of the Air Board shall be paid such salaries as the Governor in council may determine.

Duties of the Air Board

(3) It shall be the duty of the Air Board:

(a) To supervise all matters connected with aeronautics.

(b) To study the development of aeronautics in Canada, and in other countries, and to undertake such technical research as may be requisite for the development of aeronautics, and to co-operate with other institutions in the carrying out of such research.

(c) To construct and maintain all Government aerodromes and air stations, including all plant, machinery, and buildings necessary for their efficient equipment and upkeep.

(d) To control and manage all aircraft and equipment necessary for the conduct of any of His Majesty's Services.

(e) To operate such Services as His Majesty and the Governor in Council may approve.

(f) To prescribe aerial routes.

(g) To co-operate with all other officers of His Majesty and to assist in the carrying out of any services under their jurisdiction which may require aerial work of any nature, and to collaborate with the officers employed in existing Air Service of His Majesty in such extension of their present work as the development of aeronautics may require.

(h) To take such action as may be necessary to secure, by international regulation or otherwise, the rights of His Majesty in respect of His Government of Canada in International Air Routes.

(i) To co-operate with officers of the Departments of Militia and Defense, and of the Naval Service on all questions relating to the aerial defence of Canada.

(j) To co-operate with the Air Staffs or Authorities of other Governments or Countries for any purposes pertaining to Air Services.

(k) To investigate, examine and report on all proposals for the institution of Commercial Air Services within or partly within Canada or the territorial limits of Canada.

(l) To consider, draft, and prepare for approval by the Governor in Council such regulations as may be considered necessary for the control or operation of aeronautics in Canada, or within the limits of the territorial waters of Canada.

(m) To perform such other duties as the Governor in Council may from time to time impose.

Powers of the Air Board to Make Regulations with Approval of Governor in Council

(4) (1) Subject to the approval by the Governor in Council, the Air Board shall have power to regulate and control aerial navigation over Canada and the territorial waters of Canada, and in particular, but not to restrict the generality of the foregoing terms of this section it may, with the approval aforesaid, make regulations with respect to:

(a) Licensing pilots and other persons engaged in the navigation of aircraft, and the suspension and revocation of such license.

(b) The registration, identification, inspection, certification and licensing of all aircraft.

(c) The licensing, inspection and regulation of all aerodromes, and air stations.

(d) The conditions under which aircraft may be used for carrying goods, mails and passengers, or for the operation of any commercial service whatsoever, and the licensing of any such services.

(e) The conditions under which goods, mails, and passengers may be imported into Canada, or from Canada, or within the limits of the territorial waters of Canada, or may be transported over any part of such territory.

(f) The prohibition of navigation of aircraft over such areas as may be prescribed, either at all times, or at such times or on such occasions only as may be specified on the regulation, and either absolutely or subject to such exceptions or conditions as may be specified.

(g) The areas within which aircraft coming from any places outside of Canada are to land, and the conditions that are to be complied with by any such aircraft.

(h) Aerial routes, their use and control.

(i) The institution and reinforcement of such laws, rules and regulations as may be deemed necessary for the safe and proper navigation of aircraft in Canada, or within the limits of the territorial waters of Canada, and

(j) The organization, discipline, and efficiency and good Government, generally, of the Officers and men employed under the Air Board.

Penalty

Any person guilty of violating the provisions of any such regulation shall be liable, on summary conviction, to a fine not exceeding one thousand dollars, or to a term of imprisonment not exceeding six months, or to both fine and imprisonment.

All regulations enacted under the provisions of this act, shall be published in the Canada Gazette, and upon being so published shall have the same force in law, as if they had formed part of this act. Such regulations shall be laid before both Houses of Parliament, within ten days after the publication thereof, if Parliament is then sitting, and if not, within ten days of the next meeting thereof.

Officers and Men

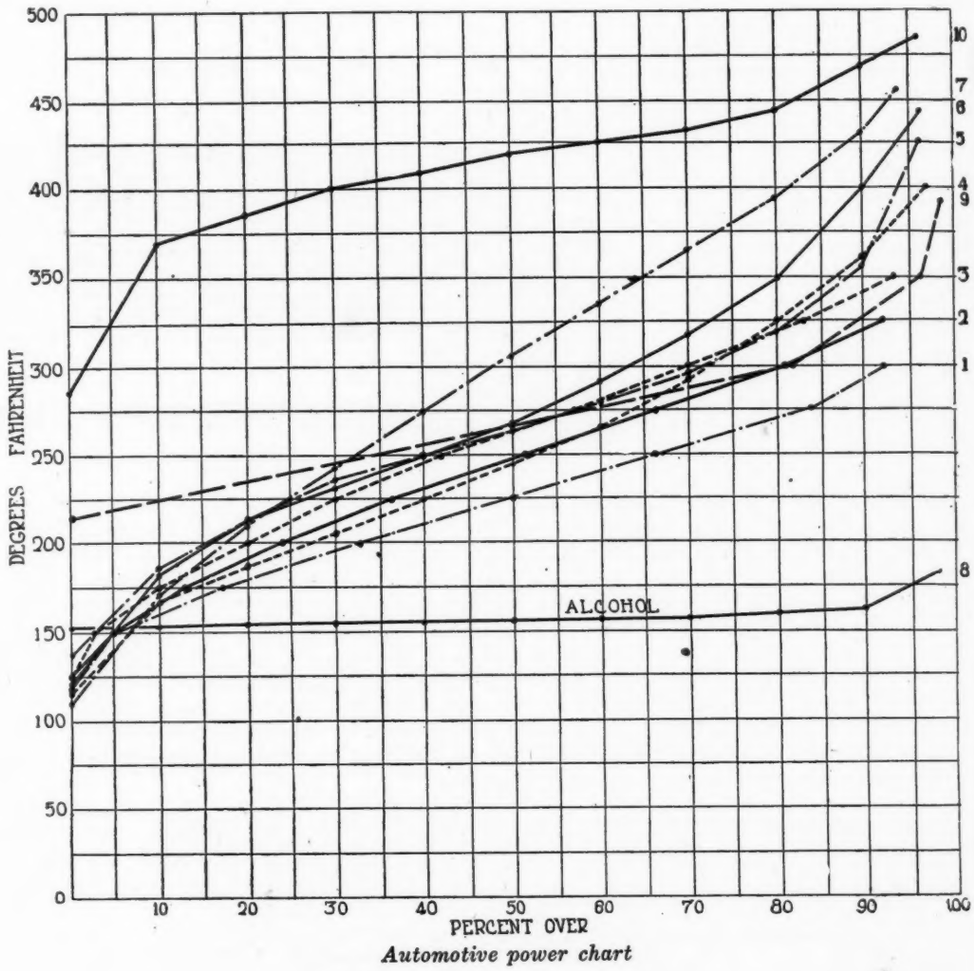
(5) The Air Board shall have power to employ such officers and men under this act, as may be authorized by the Governor in Council, under such conditions as to discipline and pay as the Governor in Council may determine, and may make such arrangements for their training and housing, board, clothing and equipment, as may be deemed necessary, and as may be approved by the Governor in Council.

(6) Subject to the provisions of the Civil Service Act, 1918, the Air Board shall have power to employ such officers, clerks, and employees as may be necessary for attending to the business of the Air Board.

(7) All salaries mentioned herein, and all expenses incurred under the provisions of this act, shall be paid out of such money as may be appointed by Parliament therefor.

Changes in the Quality of Motor Fuel

THE chart shows curves of distillation of motor gasoline purchased in Detroit at various times during the period from April 5, 1916, to June 18, 1919, as well as of alcohol. Curves No. 1 to 7 inclusive show the changes in gasoline bought in tank cars during this period. The end point was raised from 300 to 455 deg. F. Following is a key to the curves: Curve No. 1, gasoline purchased April 5, 1916, gravity 60.5 deg.; No. 2, gasoline purchased July 10, 1916, gravity 57.5 deg.; No. 3, gasoline purchased Sept. 11, 1916, gravity 56.8 deg.; No. 4, gasoline purchased June 9, 1917, gravity 56.8 deg.; No. 5, gasoline purchased Jan. 24, 1919, gravity 57.3 deg.; No. 6, gasoline purchased April 30, 1919, gravity 55.7 deg.; No. 7, gasoline purchased June 18, 1919, gravity 55 deg.; No. 8, alcohol purchased October, 1918, gravity 42.2 deg.



Automotive power chart

Laminated Gears

A LAMINATED metal gear for camshaft drives, etc., is being manufactured by an English concern. The hub of the gear wheel has one integral and one loose flange; clamped between the two flanges by a series of screws in the finished wheel is a number of flat steel plates or rings with distance washers between each contiguous pair. The rings are of steel—1/16 in. thick in the case of distribution gears for automobile engines—and, arranged as a blank, have teeth machined on their outer peripheries. After the teeth have been cut, alternate rings are slightly rotated, so that the teeth are staggered by an amount equal to half the pitch. Silent running and low cost as compared with the silent type of chain are advantages claimed for this system.

Overland-4 Design Has High Production Merit

The fact that the Overland company is to concentrate its facilities upon the production of a single model of car lends added interest to the design of the Overland-4, which is here presented in detail for the first time. The spring suspension, which by overhang extends the distance between spring supports to 130 inches on a 100-inch wheelbase, is the most radical change made from usual practice.

IN future, only one model Overland will be produced, known as the Overland-4. This step marks a departure from previous Overland practice, which was noted for a multiplicity of models. The Knight car, of course, will be continued under the name of Willys-Knight, and the Willys Corp., a separate organization, will produce a six in the East, while the one Overland model will be the small chassis first exhibited at the New York show in January, 1918. Since that time it has been refined in minor details, but none of the main features of the car has been changed.

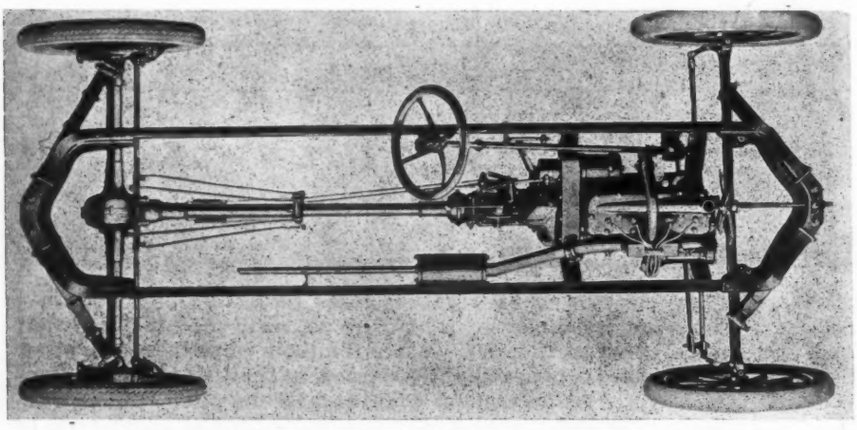
The Overland-4

A wide departure from previous practice in the matter of spring suspension is the only radical feature. Mounted on a wheelbase of 100 in., the spring suspension is so arranged that the distance between the spring supports is 130 in. This suspension, which is virtually a cantilever system, projects ahead of the front axle and behind the rear axle, thus giving an overhang of 15 in. beyond the axles on each end. For this arrangement, great things are claimed by the Overland company, as those who attended the S. A. E. meeting at Ottawa Beach will remember from the remarks made by E. H. Belden, chief engineer.

The short wheelbase and overhanging springs give a car which, though fitted with a roomy five passenger body, weighs less than 2000 lb. and can be manufactured to sell, with full equipment, at $845, which is a moderate price considering the present material situation.

On this chassis, in addition to the touring body, there will be mounted a roadster at $845, a sedan at $1355, and a coupe at $1225. Deliveries on the new car are already starting and production, which is now running about 350 daily, is being increased as rapidly as possible.

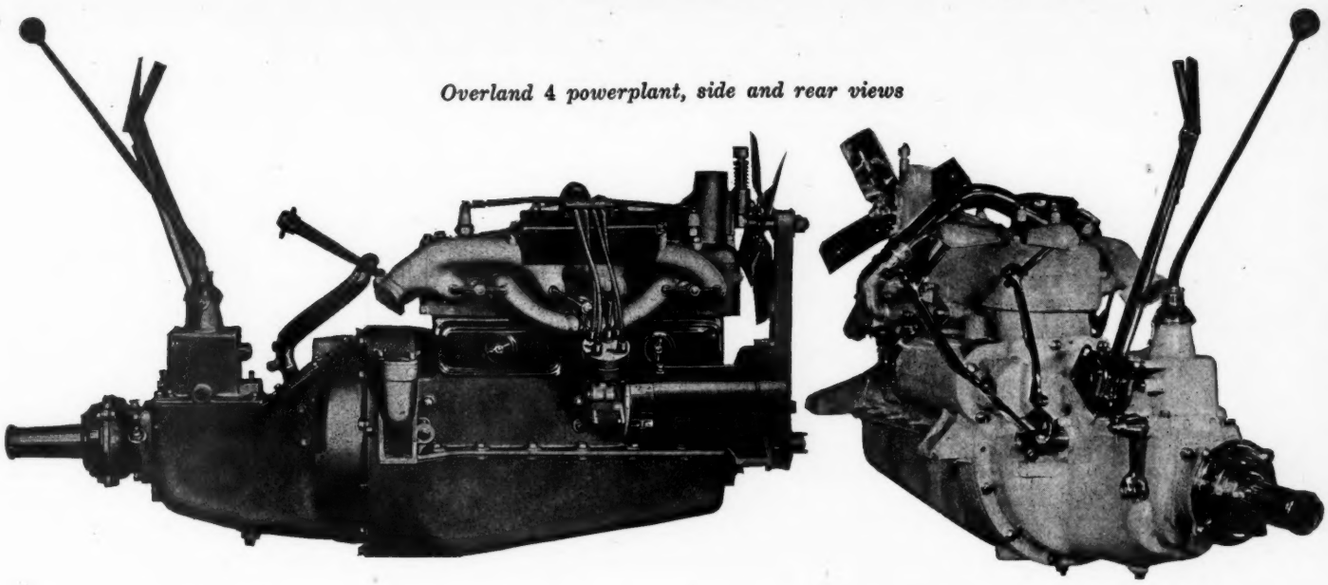
The extreme simplicity of the chassis is an outstanding feature. A unit power-plant, propeller shaft enclosed in a torque, and a ¾ floating rear axle enclosed in a two part malleable iron housing comprise the driving parts. The frame has parallel side members with very heavily reinforced end pieces to take care of the stresses imposed by the spring suspension, with no cross-members between the rear end of the frame and the engine support, thus giving a flexible structure rather than attempting to obtain rigidity.



Illustrating the 100-in. wheelbase with the 130-in. springbase

In fact, the chassis suspension is practically a three-point arrangement. There is but one shackle on the entire [illegible] at the left rear spring. The other point of spring suspension is fixed.

When this car was first put on the



Overland 4 powerplant, side and rear views

board, it was designed to sell at a price between $200 and $300 less than that now quoted, and the entire design throughout indicates the careful study of the car from manufacturing requirements. The castings are simple, the amount of machine work required is small, and the design has been handled in such a way that several cuts can be taken at the same time.

The engine is a conventional detachable L-head design with integrally cast cylinders and crankcase. Its cylinder dimensions are 3⅜x4 in. The aluminum pistons have three ring grooves, two above and one below the piston pin. These are individually cast rings, 3⅜ in. in diameter by 3/16 in. wide, exerting a pressure of 3 to 5 lb. against the cylinder walls. The piston pins float in the piston, being clamped in the upper end of the connecting rod. They are 0.734 in. in diameter and 1 15/16 in. in length. The pistons are 3¾ in. long.

The connecting rods are 7 in. I-beam drop forgings of carbon steel, equipped with removable shell type bearings, shimmed to allow take up. The lower rod bearing is 1⅜ in. by 1½ in. The crankshaft bearing diameters and lengths are respectively 1⅝ in. by 1¾ in. for the center bearing and front bearing, and 1⅝ in. by 2½ in. for the rear. These bearings are die-cast babbitt, and in manufacturer are reamed to size. The bearing caps are shimmed for adjustment. The flywheel is a semi-steel casting, 13.2 in. in diameter, machined all over and marked for ignition timing. It weighs 52½ lb. and is drilled to balance after assembly to the crankshaft. The teeth in this flywheel act as an oil carrier in the lubricating system as well as serving in cranking the engine.

Helical timing gears drive the valves, a train of three gears being employed for the crankshaft, generator shaft and camshaft. There are 32 teeth in the crankshaft and generator shaft gears, and 64 in the camshaft gear, and the gears are located at the front end of the crankcase in a separate housing. The camshaft is drop forged, with cams integral, and is mounted on three bearings, the front bearing being die cast and the center and rear of bronze. The size of these bearings, diameter and length, are, respectively, 1¼ in. by 1⅝ in. front, 1.633 in. by 1¼ in. center and 1¼ in. by 1¼ in. rear.

The valves are lifted through mushroom tappets of ⅝ in. diameter, guided in a cast-iron guide of ⅝ in. diameter and 1 7/16 in. length, this guide being integral with the crankcase. The valves are standard poppet type, with a 1 9/16 in. head diameter, ⅜ in. stem diameter and 1⅜ in. diameter in the clear. The seat is at an angle of 30 deg. and the lift is 7/32 in. The valves are timed so that the intake opens at 0.97 in. on flywheel rim past upper dead center and closes 2.83 in. past lower dead center. The exhaust opens at 3.64 in. before lower dead center and closes 0.81 in. past upper dead center.

Precautions have been taken to insure an ample supply of water through the thermo-syphon system. The jackets are large and the radiator is a cellular type with non-corrosive sheet brass tubes made of an alloy of 60 per cent copper and 40 per cent zinc. The radiator shell is a pressed steel one-piece unit, and to assist cooling there is a fan shroud on the radiator. Tests have been made on this installation to show that there is no dead point on the radiator with the air being drawn through the corners as well as through the center. Capacity of the cooling system is 3 gal. and 3 qt., the total cooling area is 54 sq. ft., and the total frontal area is 2.2 sq. ft.

The fan is a four-blade, steel stamping, belt driven, with an adjustment provided through the fan shaft lock bolt. It will be noted that in this installation the fan belt is in front of the fan, thus allowing the best to clear the timing gear case readily and the fan to be in about the same plane as the timing gear case, reducing the overall length of the engine to the minimum.

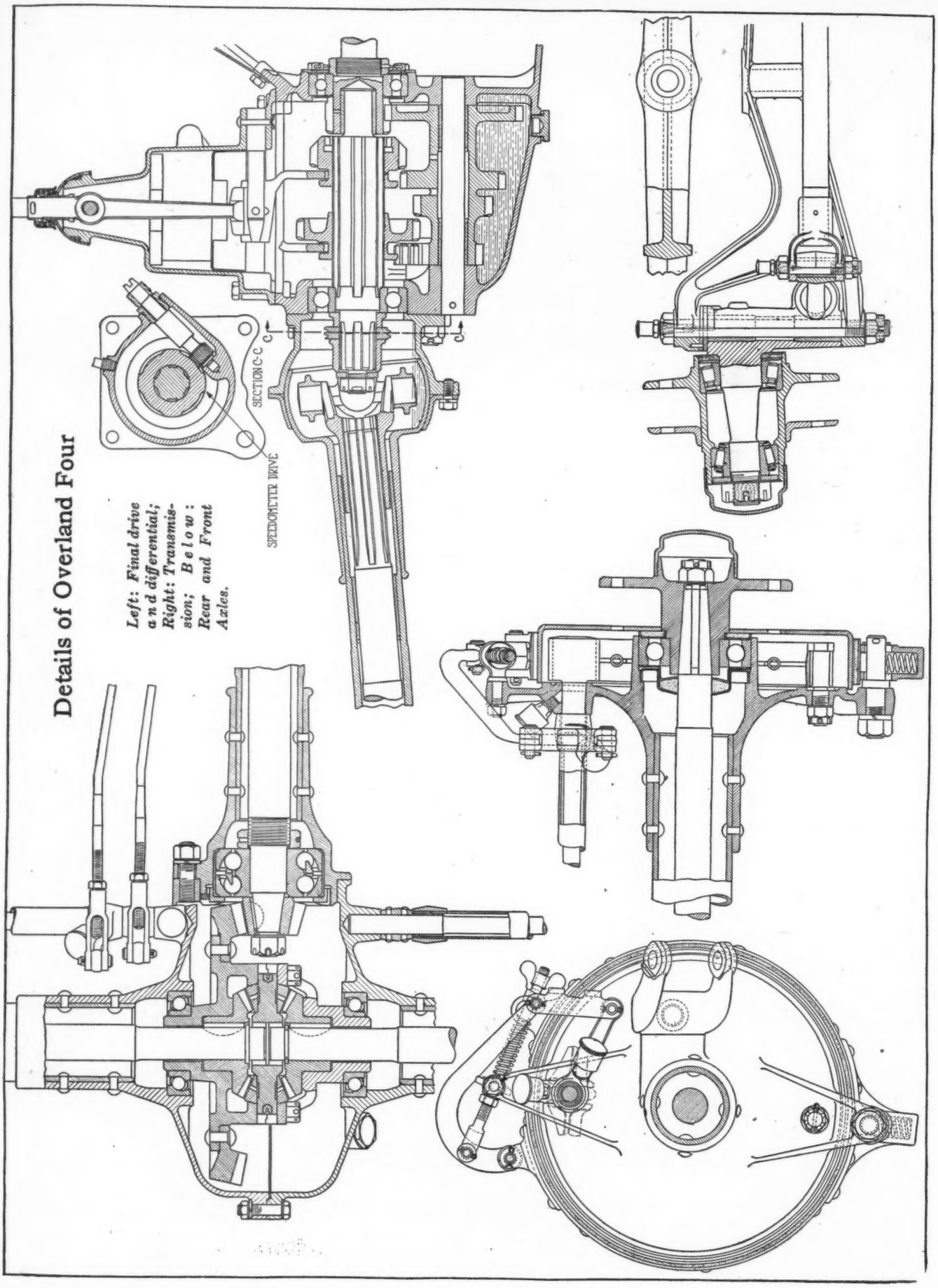
Constant circulation of the oil is maintained by the flywheel gear teeth. The oil is picked up from the reservoir and thrown into a strainer, where it is filtered. It is then led to the main feed pipe, which runs the full length of the cylinder block. Three holes connect this feed pipe with the crankshaft bearings. Scoops on the lower ends of the connecting rods splash the oil to the cylinders and other bearings. The timing gears are lubricated through a small hole in the end of the main oil feed line above the front main bearing. The oil in the crankcase communicates with the clutch, gearset, universal, speedometer gear, generator and starting motor drive end bearings. The capacity of the system is 1½ gal. There is a float oil lever indicator on the left side of the engine.

Locating the gasoline tank under the cowl provides a gravity feed for the fuel, giving the simplest possible form of construction. The tank filler is on the left side of the tank, this being done so that when the car is in its natural position on the right side of a crowned road it is possible to fill the tank without overflow. The material used in the tank is terne plate stamping.

The carbureter is a ¾-in. Tillotson, of the type used in

Details of Overland Four

Left: Final drive and differential; Right: Transmission; Below: Rear and Front Axles.



previous Overland Willys-Knight cars, equipped with hot-air attachment. It is on the opposite side from the intake manifold, the gases being drawn through the cylinder blocks. The inlet manifold, as well as the exhaust, is cast separately and attached to the cylinder blocks by three clamps.

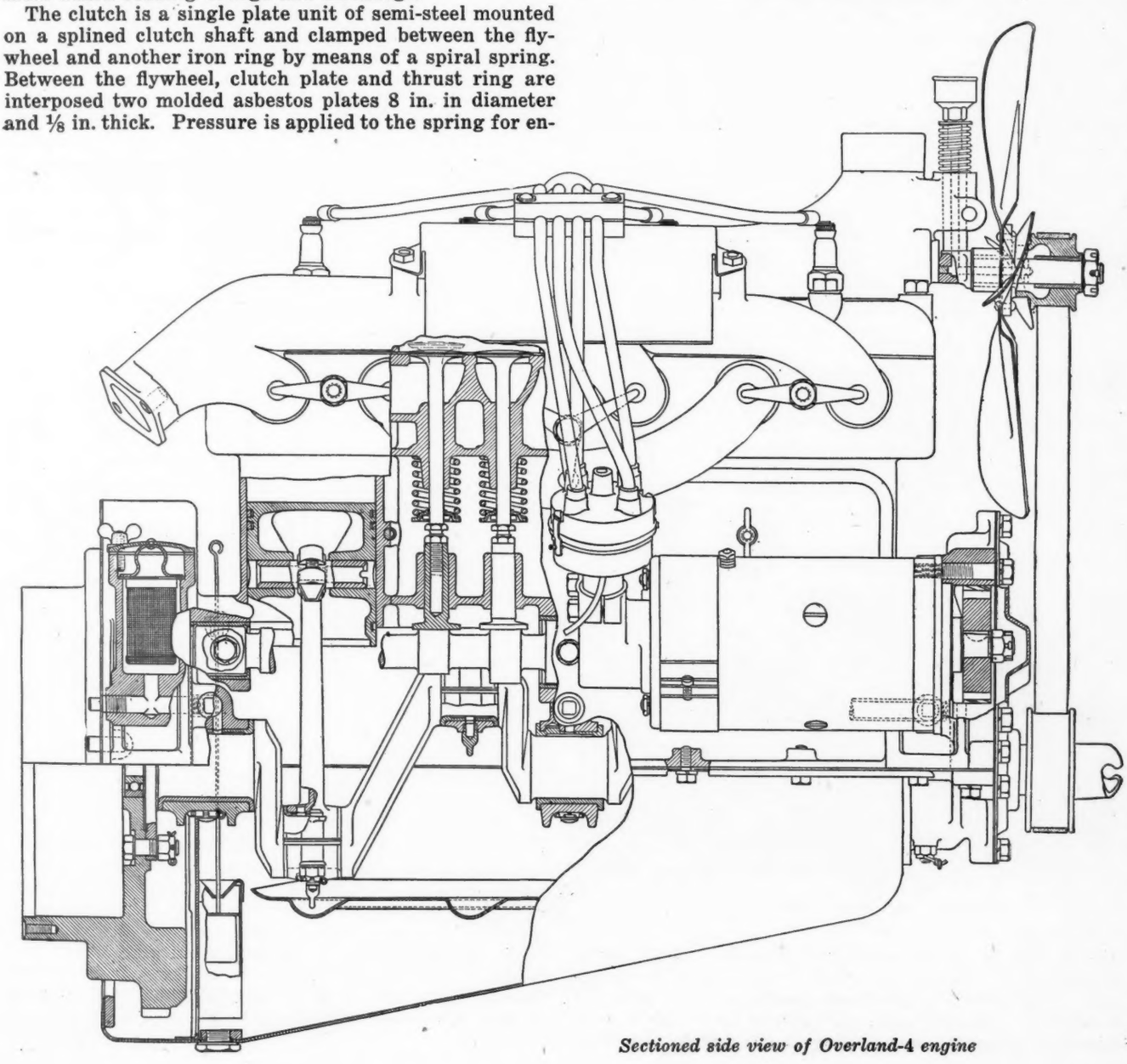
Auto-Lite electrical equipment supplies lighting, starting and ignition. The generator is of the 4-pole type with third brush regulation, the cut-in point being approximately 7½ m.p.h., and the minimum output of 14 amperes being secured at 22 to 24 m.p.h. This is mounted on the left front side of the engine. The battery is 11-plate, 3-cell, 6-volt type, rated at 80 ampere-hours. It is located beneath the driver's seat. No battery cover is needed, as the wooden seat lid protects the battery and at the same time provides ventilation.

The circuit breaker is an Auto-Lite rectangular type, with the cut-out speed 6 m.p.h., this being 1½ m.p.h. less than the cut-in speed, thereby avoiding frequent cutting-in and cutting-out when traveling at very low speed. The regulator is mounted on the right gasoline tank bracket. A current indicator is mounted on the instrument board reading charge and discharge.

The clutch is a single plate unit of semi-steel mounted on a splined clutch shaft and clamped between the flywheel and another iron ring by means of a spiral spring. Between the flywheel, clutch plate and thrust ring are interposed two molded asbestos plates 8 in. in diameter and ⅛ in. thick. Pressure is applied to the spring for engagement through three toggle levers by a 300-lb. spiral spring. The entire clutch assembly operates in oil and is constructed in a unit with the engine and gearset, thus giving a completely encased part.

The transmission gearset is of practically standard construction, providing speeds in the box of 3.62 to 1 on first; 2.03 to 1 on second; 1 to 1 on high and 4.83 to 1 on reverse. The gears are of the stub-tooth variety, with the main shaft supported at the front end in a phosphor bronze bushing, ⅞ in. in diameter and 1 7/16 in. long, and in the rear by an annular ball bearing. The countershaft is carried in two phosphor bronze bushings 1.72 in. in diameter and 1⅜ in. long, and the reverse idler gear rotates on a phosphor bronze bushing 1 in. in diameter by ⅞ in. long. The gears are 7/9 pitch, nickel steel, the countershaft gears being all made in one forging.

Because of the use of a torsion tube, only one universal is necessary. This is a doubled yoke and double ring type, drop-forged with the four ground pins running in oil and enclosed in a ball and socket joint of malleable iron. The propeller shaft has a maximum diameter of 1⅜ in. It is of nickel steel and supported at the front



Sectioned side view of Overland-4 engine

end on a phosphor bronze bushing, 1 3/16 in. in diameter by 2 in. long, and at the rear end on a double row ball bearing, taking both the radial and thrust loads.

The torsion tube is of round tapered seamless carbon steel tubing. The front end slides in a ball joint and the rear end is forced into place by hydraulic pressure and riveted to the propeller shaft bearing carrier.

The three-quarter floating rear axle is carried in a two-part malleable iron housing, carrying the differential and two steel axle tubes and two malleable iron brake supports pressed and riveted together. The differential is a four-bevel pinion type, located concentrically with 12 teeth in the pinion and 24 teeth in the gear, all gears being 7/9 pitch. The differential is carried on two annular ball bearings, each capable of taking end as well as radial thrust. The drive pinion and gear both are of nickel steel, the pinion containing 10 teeth and the ring gear 45, giving a reduction of 4.5 to 1. These gears are spirally cut.

Both sets of brakes are on the rear wheel, the braking surface for the foot brake being 47⅛ sq. in. and the hand brake 38¼ sq. in. The wheels are 30 in. in diameter and carry 3½-in. tires. They are the 12-spoke artillery type with demountable clincher rims. The front wheels are on taper roller bearings and the rear on annular ball bearings.

Planetary steering is used, this having been found to be very satisfactory in a car of this weight. The turning radius is 33.5 ft. The steering wheel, 16 in. in diameter, is connected by a tube to the pinion shaft. This shaft is supported by a phosphor bronze bearing, 11/16 in. in diameter by 3 in. long, with a spur pinion cut at its end. This pinion meshes with three other pinions mounted on the spider of the steering arm shaft and is likewise supported on a phosphor bronze bearing, ¾ in. in diameter by 1 15/16 in. long. The three pinions mesh at the same time with a stationary internal gear, thus transmitting any motion of the steering wheel to the steering arm on a reduced scale.

Pressed steel, channel section side bars are used in the frame construction, these being 3½ by 1¼ by 3/16-in. channel section. The springs are fastened to the frame at the front end by bolts and to the front axle close to the wheels with eye bolts. The radius leaves act as guides for the front axle. The rear left spring is bolted to the frame and shackled to the brake support on the rear axle, and the rear right spring is bolted to the frame and fastened to the brake support on the rear axle with an eye bolt, thus providing the one spring shackle construction for which this suspension is noted.

All elongation of spring centers is taken care of by this single shackle. The car is driven through the springs, the reason given for this being that the driving stresses on the axle are taken directly at the wheel instead of at the center, thus permitting the use of a lighter axle and less unsprung weight.

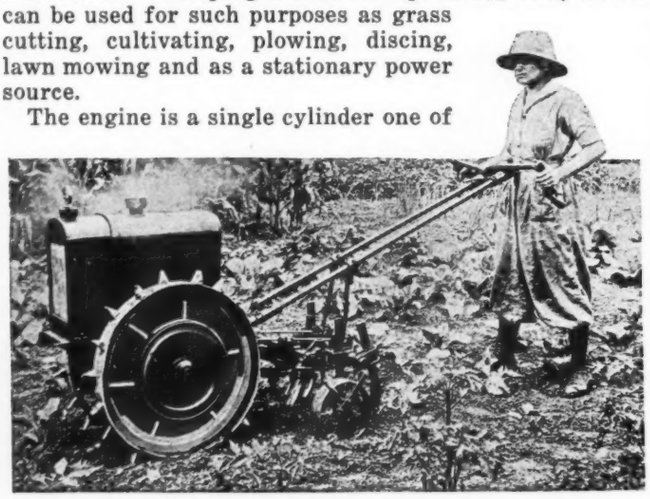
The body is all steel, with a baked enamel finish. This is impossible with a wood body, as the enamel is baked at a temperature higher than could be endured by wood.

The front seat is 40 by 15 in. and the rear seat 46 by 18½ in. The tonneau legroom or the distance from the front of the rear seats to the back of the front seat is 20 in. The upholstery is detachable, with Marshall springs throughout, with cotton and interlaced hair pads. The upholstery material used is the long-grained Duratex. The top is a one-man, 4-bow type, clamped to the windshield, with storm curtain carriers on all four doors. The shipping weight is 1,825 lb., and complete with gasoline, oil, water, tools, side carrier and extra rim, the car weighs 1,940 lb.

Tractor as a Cultivator

THERE has been considerable rivalry in the development of a tractor to replace the one-horse cultivating outfit on farms. The Utilitor is one of these products. It is a tractor developing a drawbar hp. of 1½ to 2, which can be used for such purposes as grass cutting, cultivating, plowing, discing, lawn mowing and as a stationary power source.

The engine is a single cylinder one of 3½ in. bore by 4½ in. stroke, and runs at a normal speed of 1200 r.p.m. Its belt hp. is 2-4. It is fitted with a Kingston ¾-in. carbureter and uses gasoline as fuel, which is carried in a 1½-gal. tank. Ignition is by a high-tension Eisemann magneto, and cooling is effected by the thermosyphon system, with honey-comb radiator and fan. There is a positive clutch on each drive wheel, so that by releasing one clutch power will be applied to one wheel only, and the tractor pivot around the other wheel. From the engine crankshaft to the drive wheel the speed of rotation is demultiplied 35 times. The drive wheels are 24¾ in. in diameter. The whole machine measures 84 in. in length over all, 17½ in. in width, and 36 in. in height. It weighs 700 lb.

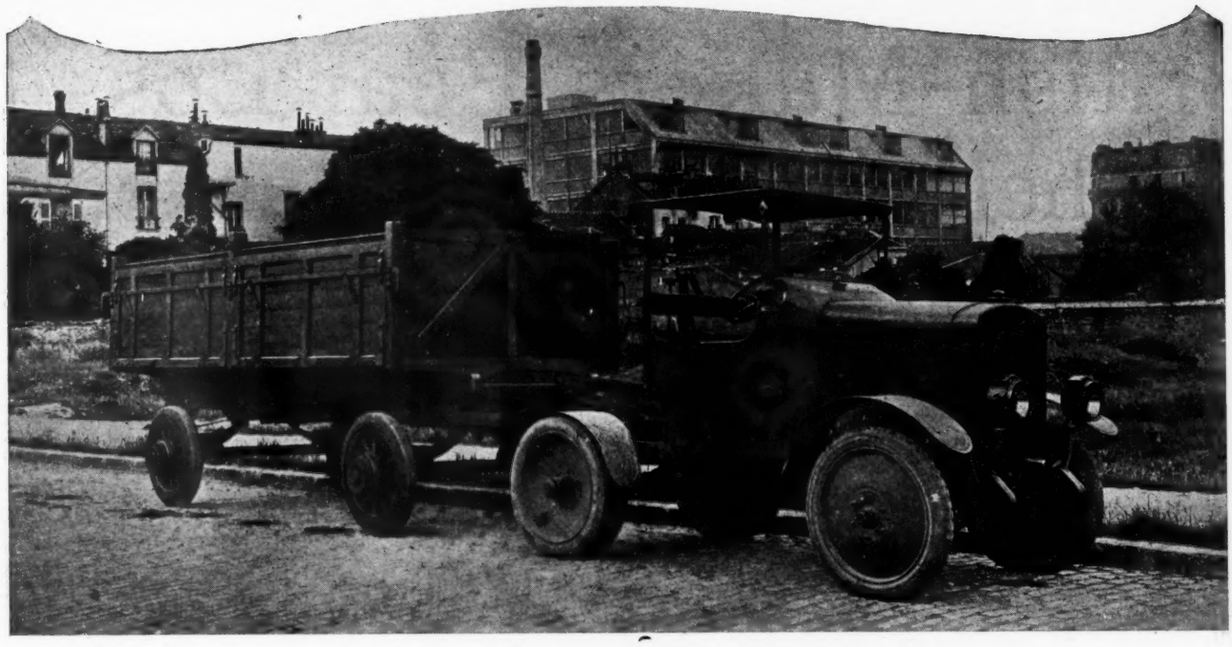


Utilitor Cultivating a Truck Garden

The belt pulley is 4⅝ in. in diameter. There is only one forward gear reduction, but under a varying load and throttle control the tractor speed will range from 1 to 4 m.p.h. The tractor is capable of pulling a 7-in. plow, and a plowing speed of 2½ miles is recommended. The final drive is by internal gears. The machine is manufactured by the Mid-West Engine Co.

Gluing Wood Coated with Varnish or Shellac

GLUE joints between wood surfaces which have been coated with shellac or varnish have low or very erratic strength. This has been thoroughly demonstrated by a recent test at the Forest Products Laboratory, Madison, Wis. The greatest strength value obtained was 1,712 lb. per sq. in., which is low for casein glue. The other values were 1,900 lb. per sq. in. or less. It is evident, therefore, that all shellac or varnish should be carefully cleaned from wood which is to be glued, if high strength is desired.



Chenard-Walcker short wheelbase light tractor

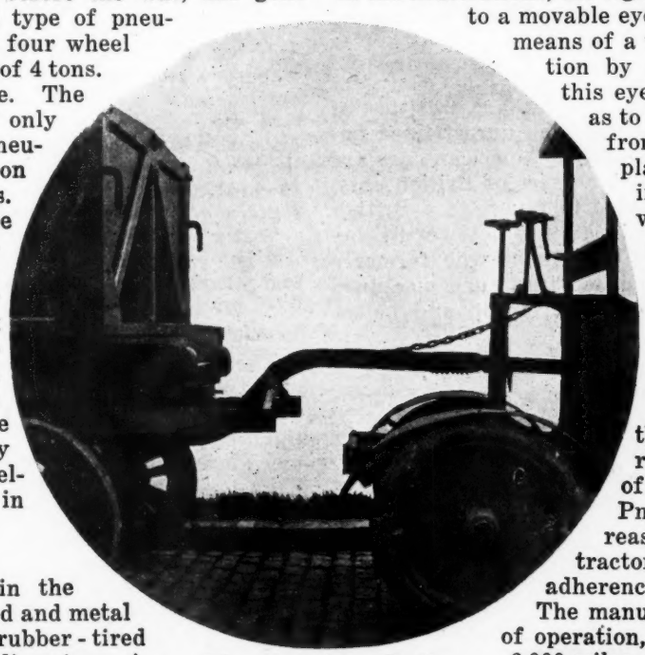
New French Tractor Hauls Heavy Load On Pneumatics

Low operating costs are claimed for this machine, which has a wheelbase of only 90 in. and can haul a useful load of eight tons on a good surfaced road.

THE Chenard-Walcker Automobile Co., French touring car manufacturers before the war, has gone into production on a special type of pneumatic-tired tractor hauling a four wheel trailer carrying a useful load of 4 tons. The design is rather unique. The tractor has a wheel base of only 90 in. and is fitted with pneumatic tires of 34 x 4½ in. on Michelin steel disk wheels. The wheels are dual at the rear and, being interchangeable, only one spare is carried. A Chenard-Walcker four cylinder engine of 3.1 x 5.9 in. bore and stroke supplies the power through a four speed gear box and an internal gear rear axle. The weight of the tractor is only 3,000 lb. and its short wheelbase enables it to turn easily in a street 16 ft. wide.

Patented Features

There is nothing unusual in the trailer design, which is a wood and metal construction with wood rubber-tired wheels and axles 2.7 in. in diameter. A patented system is adopted to vary the adherence of the rear wheels of the tractor. As shown in the illustrations, the rigid trailer drawbar is connected to a movable eye on the trailer platform. By means of a worm and screw put into motion by a crank and bevel gearing, this eye can be raised or lowered so as to exert greater or less pressure from the trailer on the tractor platform. The greater the load in tow, the higher the downward pressure applied to the platform of the tractor.



The connection embodies unusual features

Load Capacity High

The claim is made that, with this system, the tractor can start away on a 10 per cent gradient with a useful load of four tons in tow and that, on a good surfaced level road, it can haul a useful load of eight tons on two trailers. Pneumatic tires are justified by reason of the longer life of the tractor mechanism and the better adherence obtained.

The manufacturers state that the cost of operation, calculating on a distance of 6,000 miles, with a useful load of five tons, is at the rate of 40 cents per mile.

British Makers Fear Loss of Their Home Car Markets

Conditions of the passenger car, truck and tractor fields in England are discussed by a London Correspondent. American machines are seen to be making rapid strides throughout that country as the home manufacturers fail in their production plans. The future of power farming also is discussed briefly.

London.

THE final efforts probably are being made by the British Motor and Allied Manufacturers Association to reverse the Government's recent removal of the ban on imports, except for a few "key" industries. A deputation representing the truck and tractor branches of the British trade will discuss this problem with the Minister of the Board of Trade on Sept. 22 and will demand the imposition of a restricted import as well as a tariff of 33⅓ per cent on both classes of imports.*

The matter is being discussed vigorously in the press, but principally from the standpoint of the car dealer and user.

In so far as it concerns the car dealer, it is clear from this correspondence that the British makers recognize that they are unable to supply the cars now on order before the middle of next year and that they, at least, need no protection because of their admitted inability to meet the demand. From this it may be inferred that the British cars cannot be genuine post-war models or that the orders given early this season and at the close of 1918, after the end of the war, are to be cancelled in favor of cars that, at the time, did not exist even, perhaps, on paper.

However, this fact does not prevent some critics of the situation from arguing against the unrestricted import of cars on the ground that, once American cars are in the hands of hitherto exclusive users of British cars, their owners will be too satisfied to revert to a British car. This sort of testimony is all too noteworthy because it comes from the kind of persons who formerly decried American cars and boasted that such machines would not appeal to the more experienced and better grade motorists.

The following summary of a recent interview with one of London's largest car retailers puts the issue appositely:

"The American dealers offer me really excellent cars—so excellent and on such terms that, although I have not dealt in any way with American cars, it is commercially impossible to refuse all business. I have owned and dealt in motor cars for many years, and I assure you I would never have believed it possible that the United States or any other country could offer us such goods.

"The plain fact is that the British public is clamoring for cars and cannot get them from the home factories. The British buyers are sick of promises that are never kept. Now that these American cars are coming over, the British buyer simply will throw over his home order."

Repairs Are Slow

Another phase of the situation is seen by the following letter in today's **Times** from a "Professional Man":

". . . On March 23, 1917, I took my car into a garage within five miles of the works at which it was built to have a new pinion put into the back axle. The car is there yet. I waited three months and bought another machine of a well-known English make and drove it until January this year, when one of the pistons broke.

"I took the car to another garage only 45 miles from the works where the car was built. It is there yet. I waited six weeks for it and then bought one of the more expensive American models. In June I broke a pinion in the back axle, exactly the same damage as to the first car. In five days my machine was back on the road as good as new."

Another correspondent gives to the **Daily Mail** the following experience:

"The treatment we have received from British makers has been so bad that we are bound to wipe out all patriotism and buy American cars.

"I ordered an English car in January at a provisional price and received a notification in June asking me to confirm the order at an advance of about £75 ($375). This I did. In August, I received another notice asking me to confirm my order again at a further increased price.

"I then called on a few English agents who have cars for disposal and inquired the prices of used cars worth, in my judgment, about £175 ($875). The price was quoted at £350 ($1,750) and I was informed that they could not say when supplies of new machines would be forthcoming.

"After three or four experiences such as this, I went to an American agency. Here I was received with courtesy and told what supplies would be coming along. I was given a fixed price, and I am to receive delivery this month."

Trucks and Tractors

The issue is somewhat different as regards the truck and tractor claimants for import restraint and tariff. The grievance of British truck makers is limited to the light class of truck. But as this branch of the trade has always been neglected by the British makers, who have concentrated on 3 and 3½ ton and larger vehicles, for them to ask a restriction on this class of import is tantamount to telling the public and dealers alike that they must do without such machines until they can get them of British make.

However, this smaller machine is the type most needed to aid in removing the congestion of merchandise at the wharves and railway yards. The potential size of the light truck trade in Great Britain may be gaged from

* NOTE.—Since this article was written, cable dispatches form London have chronicled the failure of the British makers to induce the Trade Minister to consider the requested reversal. The conference was held, as forecasted, and resulted in statements from the Minister that neither the restrictions nor the desired tariff would be imposed.

the fact that not 5 per cent of the traders and shopkeepers using such vehicles have motor trucks and that about 30,000 Ford vans have come into use since the war began.

As regards tractors, the fact is that, early in 1917, when the submarine menace became acute and a plan of national land tillage was organized, Henry Ford generously offered the use of his Fordson tractor design and sent over his engineer, Mr. Sorenson, with a technical staff of advisers. It was intended then to make the Fordson tractor here and tenders were invited for the component parts. The idea, however, came to nothing, the assigned reason being a sudden and unexpected call for munitions.

It was understood then that a British tractor was to be designed and built under the auspices of half a dozen motor firms. But the plan was not materialized, largely, it was reported, because of failure of the makers to work together. Meanwhile, 6,000 Fordson tractors on order began to be delivered and the Ford Production Department, which was responsible for the national tillage scheme, got its plan organized. About 21,000,000 acres ultimately were announced as being under tillage, much of which was new land. The present plea for protection of the British tractor industry is voiced on the ground that it is an "infant" industry, awaiting development, which up to now it has been impossible to give it. Those who know the formidable position and hold of British steam and other farming plants throughout Europe for the last 50 or more years will smile at a plea of this sort.

The fact is that those responsible purposely neglected the small and light oil-engined tractor and now have to take the American machines for their model. This being so, why, may it be asked, should it be necessary, after ten months since the war, for the makers to be appealing for more time to get busy, when the designs, the plant and the knowledge for making their machines are ready at hand? Ford got his tractor into production in less than ten months.

Apropos of the British tractor industry and its prospects: in view of the coming trial of some 60 farm tractors at Lincoln, it may be useful to read the following figures, recently compiled, relating to the number and size of British farms:

> **There are 13,985 farms of over 300 acres in England and Wales, the majority of which employ steam cable plowing. There are 34,524 farms of from 150 to 300 acres, on which for the first time mechanical cultivation is being tried, and there are 49,286 farms of from 50 to 100 acres. The second category is expected to furnish the great bulk of oil-engine tractor users, a bulk that probably will include all in the third category.**
>
> **A modest estimate gives the British tractor market an immediate capacity for 50,000 oil-engined tractors, of the sort now mostly discussed; but the writer places figures nearly 50 per cent higher, basing estimate on the requirements for the 21,000,000 acres now, or until recently, under tillage, plus an allowance of 5 per cent for machines constantly out of repair. The life of an oil tractor here can only be estimated, but five years appear to be a fair allowance as far as can be conjectured.**

An indication that a new era is commencing for power farming and power road traction in Great Britain is given by the organization of a $500,000 company, styled Agricultural Tractors, Ltd. It will provide motor tractor, steam tackle, and other mechanical means of plowing and transportation, and will undertake road rolling and the development of rural transport.

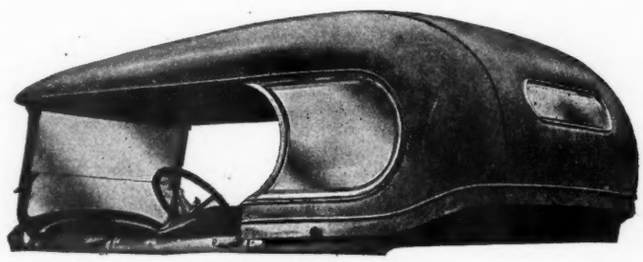
The rural and urban transport question is one of serious moment in its relation to the prompt marketing of perishable food supplies. This new company virtually will undertake both tractor work on the land for farmers and the conveyance of farm and garden produce to markets on hire or contract terms.

A Tailor-Made Automobile Top

A NEW form of top, known to the trade as the California, but in California as the Craftsman, recently has appeared. It is of the non-collapsible type, the frame-work usually being made of straight grained hickory, although oak, ash and other strong flexible wood also will serve the purpose. Great rigidity is essential and for that reason wrought iron braces and knee irons are used to hold the ribs in place.

After the inside mountings, such as the dome lights, mirrors and card cases, are installed, the lining is tacked in position. The wooden frame is then covered with heavy webbing, tightly stretched. Over the webbing is tacked a strong canvas cover, upon which is spread a thick layer of curled hair. Some layers of cotton wadding are laid over the curled hair, after which the material is shaped into the desired form. The stuffing is covered with muslin to hold it in position and the top is ready for the outer covering.

The outer covering is preferably made of some material is shaped into the desired form. The stuffing is car and, since the top is rigid and it is not necessary to bend and flex any part of it, a broader choice of materials is possible than with a collapsible top. It is understood that some owners of cars with California tops have had the bodies of their machines covered with the same material as that used in the top. Such machines, however, are a curiosity.



The California Top.

UPON recommendation of the French Commission of Metrology, the Committee of Arts and Manufactures, the National Bureau of Weights and Measures, and the Academy of Sciences, a decree has been published giving a complete subdivision of the secondary units of measure. There are no appreciable changes in the old units, but the list is completed by several that are new or are little known. The sthène is the unit of force, the pieze is the unit of pressure, the thermie is the unit of heat quantity, and in cold storage the quantities of heat removed are stated in frigories. The unit of light is lux, and the power of optical systems is expressed in dioptries.

How Welfare Work Entered the French Automotive Industry

PART II

In the previous installment of this article Mr. Bradley told of the great change in industrial systems with the changing of hours and wages. This installment is devoted chiefly to telling of the development of the welfare work that became necessary to keep up the morale of the workers. French automotive factories formerly neglected this feature. In conclusion, Mr. Bradley discusses the Italian situation briefly.

By W. F. Bradley

ONE of the greatest problems that had to be tackled was that of food. Owing to rapid growth of the industry, thousands of workers had to come a considerable distance to the factories, and many were refugees from the invaded regions who possessed nothing more than a furnished room. It was soon realized that, in order to meet their requirements and to combat the increasing cost of living, efforts would have to be made to provide food in or near the factory at reasonable prices.

Practically all the automobile factories opened canteens in which a midday meal was served and also hot meals during the night for the night shifts.

Lorraine-Dietrich, for instance, erected a canteen which was open day and night. Hot meals were served at midday, 7 p. m. and midnight. A meal, consisting of soup, meat and vegetables, cheese and dessert, cost 25 cents, but this price was later increased to 37 cents. Wine and coffee were extra, the latter being supplied at 2 cents a cup. Women had a special canteen with ovens capable of warming 200 meals at a time. Since the war the all-night service has been discontinued, but, in place of the temporary canteen, a modern clubhouse is being erected for the benefit of the workers.

At present, the number of workers is much less than during the war but meals are being continued at popular prices. Every morning, an automobile truck is sent to the central markets in Paris to buy meat, vegetables and other food at wholesale prices. A scheme is being completed whereby the factory workers will maintain their own poultry farm, have a vegetable garden and raise pigs. This is being done in co-operation with the factory management in order to combat profiteering.

The Social Work

Citroen seems to have realized more than any other motor manufacturer the value of social work among his factory hands. During the war he erected a dining hall in which 3,500 workers sat down to a hot meal at one serving. Everything was up to date. The meals were brought from the kitchens on electric trucks driven by women and placed on heated counters, from which they were served by waitresses. The dishes were cleared away in a similar manner, first from the tables to the counters and then from the counters to the kitchens by means of electric trucks. A band played during the meal, and at very frequent intervals guests were invited to eat with the workpeople. Thus, soon after the Chateau-Thierry battle, several hundred American soldiers, who had taken part in that fight, were invited to lunch with the Citroen workers. There were two doughboys to each table of French workmen or women. The officers ate on a balcony with the factory management and an American army band joined forces with French civilian musicians.

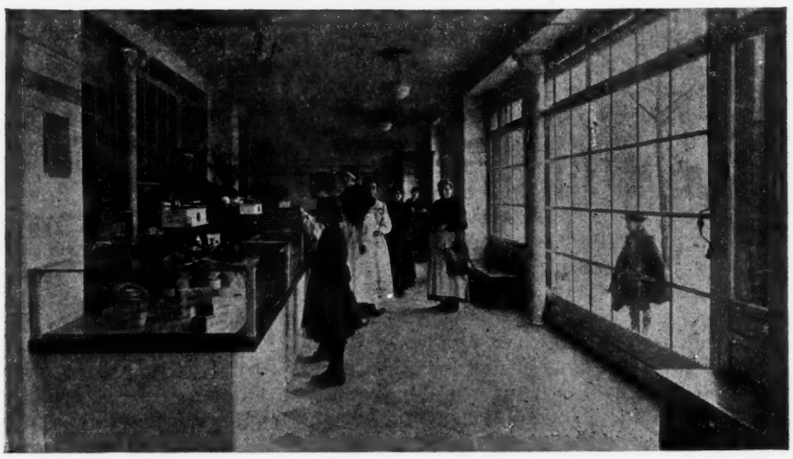
Welfare Work Growing

Even in the most important cases, the welfare work is not so important as in American factories. The growth, however, has been enormously rapid, and the movement is bound to spread, for, wages being equal, workers will naturally migrate to firms where conditions are best.

Already the standard set by such people as Renault, Citroen, and Lemoine, where are to be found clubs, sporting, musical and literary associations, co-operative societies, etc. is high. The average French automobile factory is 100 per cent cleaner, brighter, and more comfortable to work in than it was before the war. It is the exception, rather than the rule, for the employer to consider that his duty finishes with the payment of a stipulated wage for a stipulated amount of labor. In general, employers realize that their responsibility is involved in the 8-hour day and that it is incumbent on

A portion of the canteen at the Lorraine-Dietrich factory

Welfare Work in the Citroen Factory



Upper picture—This is a portion of the big dining hall attached to the Citroen factory. During the war 3500 persons were fed at one sitting every day. Center, to the left—Citroen co-operative stores; the butcher department. Center, to the right—Co-operative store attached to the Citroen factory. This is the butter and egg department. Bottom—The billiard room and rest room for office employees at the Citroen factory

them to assist their workers to obtain the greatest possible benefits from the leisure given them.

Opinions regarding the results of the 8-hour day are varied, although, on the whole, factory owners are dissatisfied. From a social standpoint, the time probably was ripe for the application of this law but it could not have been applied at a more inopportune moment for the factories. When the law went into effect, the factories were in a transition stage from war to peace conditions. Certainly 50 per cent of the machinery was standing idle, while the drawing office, the tool room and the experimental department were working at full pressure in order to prepare for new production. In these departments, the dropping of 12 hours a week was a dead loss and meant so much delay in getting into production.

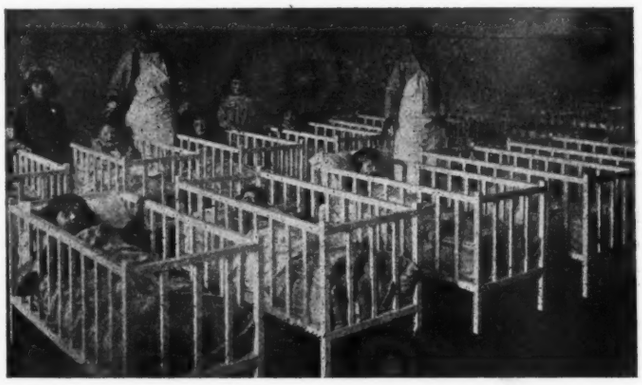
Where It Is Understood

When the law was voted, it was claimed that, as the efficiency of workers decreased with the length of the day, the drop from 10 to 8 hours would not entail a loss of 20 per cent. The two most inefficient hours were to be eliminated, workers were to agree to avoid waste moments, and owners were to adopt more up-to-date methods and machinery. In view of the transition period, it has been impossible to make many changes in plant or methods and this undoubtedly accounts, in a large measure, for the general dissatisfaction of employers.

At the Gnome factory, where Laurent Seguin put the 8-hour day into effect before it had been enforced by law and where the experiment was first made of working 8 hours with a break of only half an hour for a light meal in the factory, general satisfaction is expressed with the working of the scheme.

Instead of allowing a margin of 10 minutes after the ringing of the factory bell and tolerating another five or ten minutes to get into working clothes, it is insisted on men being at their machines on the stroke of the clock. Idling during the day has been eliminated and work is carried on at full pressure until the factory bell rings. By straight talks between factory management and workers the latter have been made to see the necessity of avoiding waste and maintaining output as high as possible.

At the Delage factory, Engineer Michelat is of the opinion that the loss is not in the ratio of 10 to 8. In this particular case the 8-hour day was adopted two weeks before it became law and the obligations which it entailed were fully explained to the workers. Consequently a start was made under good conditions and, helped by the fact that all the heads of departments were men who had been in the service of the company from the beginning, there were present all the elements necessary for the success of the movement. The Delage engineers calculate that the loss is about 1½ hours a day, but that, as production increases, this may be reduced to one hour. It is not contemplated that at any time the output will be the same for 8 hours as for 10.



Nursery attached to Renault factory

Owen Clegg, chief engineer and director of the Darracq Co., shares the opinion with the heads of many other French concerns that the 8-hour day entails a dead loss of 2 hours a day, and that this lost time cannot be recuperated. Clegg states:

"Workmen are producing no more per hour than they did during the war; if anything they are producing less, for during the war we were working at high pressure, and since the armistice there has been a general tendency towards relaxation. It is mere foolishness to imagine that any body of men will produce as much work in 8 hours as in 10."

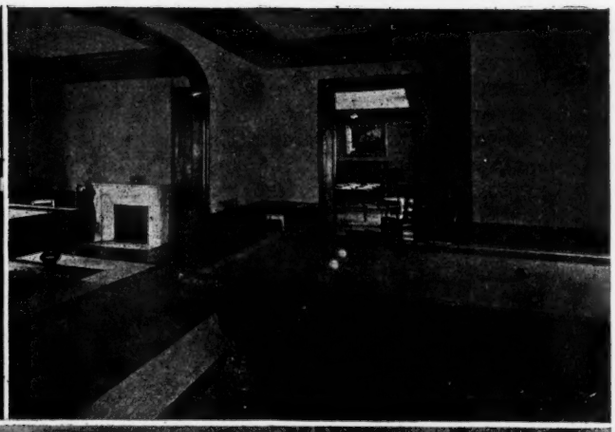
Mechanics Work Elsewhere

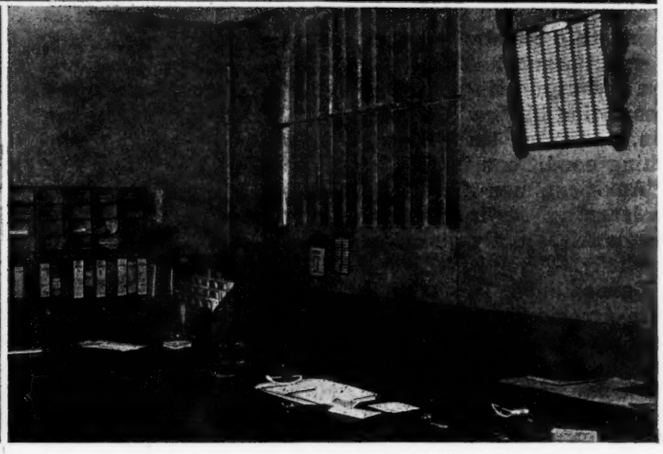
Clegg is not alone in this point of view. Scores of motor manufacturers can be found ready to testify that the 8-hour day was premature and uncalled for. Proof of this is found in the fact that many mechanics, after leaving the factory, find extra work elsewhere. Naturally industrious, having no hobbies, and used to working 10 to 12 hours a day, the French mechanic who knocks off at 3:30 o'clock in the afternoon finds time hanging heavily on his hands and finishes by finding extra work in one of the many small shops in his neighborhod. This undoubtedly is a temporary condition and will be eliminated when men learn how intelligently to employ their leisure time.

Wages in Italian Automotive Factories Compiled by French Chamber of Commerce, Milan.

		1913			1918					1919		
		Average per hour	Premium per cent	Daily Wages	Per hour Min.	Per hour Max.	Premium per cent	Indemnity	Daily Wages	Per hour Min.	Per hour Max.	Increase on 1913 per cent
1.	Foundrymen	0.07.05	27.74	$0.90.–	0.09.2	0.14.4	50.–	0.70	$2.50	0.11.8	0.18.	177
2.	Pattern makers	0.07.05	27.74	0.10.4	0.10.4	0.14.0	62.26	0.70	2.95	0.13.–	0.17.8	221
3.	Forge hands	0.06.3	24.27	0.85.3	0.09.2	0.14.4	50.–	0.70	2.49	0.11.6	0.18.–	192
4.	Boiler room hands	0.06.3	24.27	0.85.3	0.10.6	0.11.2	50.–	0.70	2.35	0.13.2	0.14.–	192
5.	Bolt makers	0.06.3	24.27	0.85.3	0.09.4	0.11.8	50.–	0.70	2.29	0.11.8	0.14.8	192
6.	Turners	0.06.2	37.39	0.91.–	0.09.–	0.14.8	65.34	0.70	2.96	0.11.2	0.18.4	225
7.	Planing m/c Operators	0.06.9	38.02	0.96.–	0.09.–	0.13.2	93.64	0.70	3.12	0.11.2	0.16.6	224
8.	Drilling m/c Operators	0.06.8	39.28	0.95.5	0.09.2	0.12.4	74.07	0.70	2.64	0.11.6	0.15.6	176
9.	Sheet metal workers	0.06.9	48.21	1.02.4	0.09.6	0.15.8	50.–	0.70	2.62	0.12.–	0.19.8	155
10.	Fitters	0.06.6	36.48	0.90.6	0.09.6	0.13.2	62.46	0.70	2.82	0.12.–	0.16.6	211
11.	Saddlers	0.06.28	33.43	0.83.9	0.09.4	0.14.–	64.41	0.70	2.92	0.11.8	0.17.6	248
12.	Adjusters	0.06.7	50.16	1.01.–	0.09.4	0.14.4	132.–	0.70	3.85	0.11.8	0.18.–	279
13.	Tracers	0.06.7	36.42	0.91.6	0.09.6	0.13.6	100.34	0.70	3.24	0.12.–	0.17.–	254
14.	Wood working m/cs	0.07.04	43.60	1.01.–	0.09.2	0.13.2	55.53	0.70	2.92	0.11.6	0.16.6	188
15.	Carpenters	0.07.46	39.56	1.04.–	0.09.–	0.13.8	67.37	0.70	2.95	0.11.2	0.17.4	184
16.	Upholsterers	0.07.29	38.60	0.98.3	0.08.–	0.12.4	78.57	0.70	3.–	0.12.2	0.15.6	205
17.	Varnishers	0.07.1	36.55	0.97.–	0.12.–	0.12.8	50.–	0.70	2.56	0.15.–	0.16.–	163
18.	Laborers	0.05.23	25.78	0.65.7	0.08.2	0.11.–	50.–	0.70	2.14	0.10.2	0.13.8	225
19.	Repair shop mechanics	0.06.8	36.12	0.92.9	0.09.4	0.12.–	50.–	0.70	2.32	0.11.8	0.15.–	147
20.	Aviation hands	0.06.8	36.12	0.92.9	0.09.–	0.13.–	50.–	0.70	2.35	0.11.2	0.16.4	147
21.	Boys, apprentices	.....	36.12	.....	0.05.6	0.08.2	56.28	0.50	1.74	0.07.–	0.10.4	147

A Club for the Renault Workers





Upper picture—Club house for Renault workers. Center, to the left—One of the dining halls at Renault Club Center, to the right—Billiard room at Renault Club. Lower picture, to the left—Reading room at Renault Club. Lower picture, to the right—Writing room at Renault Club

In other cases, the objection against the 8-hour day comes from the wives of working men. These women claim that the men have now too much time on their hands and that they either spend it foolishly or injuriously in the wine shops. Here again it is a case of education, in which the employer will have to take his share.

Another objection brought against the 8-hour day is that it already has entailed the adoption of two shifts where one was sufficient formerly. This is the case at the Goodrich tire factory and also at the De Dion Bouton automobile factory for the automatic machinery. During the war machinery was naturally not being run below its capacity, and, now that hours have been reduced, the only way to obtain the necessary production is to employ two shifts.

Workers' Value Decreased

There is a general opinion that the technical value of the French workman has decreased during the war. Four years of intensive production have had a deteriorating influence. M. Michelat, of the Delage Company, says:

"Before the war, it was considered an honor for any man to be selected for the experimental, test and racing departments, and these positions were eagerly sought for, quite independently of any increase of wages they brought. Every really good mechanic was proud to be selected for a job requiring more than ordinary skill, and there always was keen competition for such jobs. Now the men do not care; they are just as willing to do fast repetition work as to be picked out for some highly skilled job."

Italy adopted the 8-hour day during May of the present year, and immediately several of the automobile factories tried the experiment of working 8 hours without a break. Lancia abandoned it after a couple of months, the objections being that men could not change their old habits, and owing to hunger the eighth hour was decidedly inefficient. Fiat kept it on longer and, although the 8-hour stretch is still in force in some shops, the majority of departments have gone back to two shifts of 4 hours, with a big break in the middle of the day for lunch.

The mistake seems to have been made here, as in France, of making no provision for a light, quick meal. Ready cooked food was not easily obtainable, there were no efficient canteens in or adjoining the factory, and in consequence the men ate little or nothing.

Experiences in Italy

Wages in Italy have increased from 147 to 279 per cent, according to the class of workers, on the scale in force in 1913. The only recent figures having something of an official nature have been prepared by the French Chamber of Commerce at Milan for the engineering establishments of that district. According to these figures the total daily wage of skilled workers in the engineering trades in 1918 varied from $2.50 to $3.85. This amount was made up of a fixed wage, a premium for production and an indemnity for high cost of living.

Since 1918 the factories have been so disorganized and in such a transition period that it has been difficult to get accurate figures. The minimum and the maximum rates have been increased and various changes have been made in the premium and the indemnity, so that in every case the men earn as much now for eight hours labor as they did formerly for the 10-hour day.

The Chamber of Commerce figures show that Italian mechanics earn less than men doing similar work in France, the respective maximum daily earnings being given as $3.85 in Italy and $5 in France. The automobile factories, which are all situated at Turin, assert that this is an incorrect statement and that the daily wages for skilled workers in their establishments are as high as in similar works in France. In other words, a skilled worker who draws 25 francs a day in the Paris region can earn 25 liras at Turin.

South American Newspapers

WHEN the American manufacturer enters the world trade he finds that conditions for advertising are unusual. Advertising is more highly developed in America than any other part of the world. Generally speaking, in South America advertising is about 15 years behind this country. But the North American is likely to expect somewhat similar conditions as to publications. At a recent meeting of American Manufacturers' Export Association in New York, Hickman Price, an advertising man, presented the following brief outline of the publishing conditions in South America:

"American manufacturers and their advertising agents are learning, for instance, which ones of the thirty-four Buenos Aires daily newspapers can be used most advantageously. They have found that **Diario de Pernambuco** of Pernambuco, Brazil, is not only the oldest daily in Latin-America but that it is conducted in a most modern way and circulates in one of the fastest growing cities of the world; that of the seventeen dailies published in Rio de Janeiro, Brazil, **A Noite** is the evening daily which does not get out its first edition until after seven o'clock and its edition which circulates most extensively in the residential district is not off the presses until 9 o'clock. But because it carries "today's news today" from all parts of the world it is read in almost every home just before bed-time; that of the five dailies in La Paz, Bolivia, some are good for some lines, while not so good for others; that the several national circulated magazines in Chile, led by **Zig Zag** and **Sucesos**, are unquestioned result producers for North American advertisers; that **El Pais** in Montevideo is Uruguay's fastest growing front rank daily, while **El Mundo Uruguayo** is the new popular weekly, eagerly sought by readers throughout this, the smallest of all the republics; that **El Comercio** and **La Prensa** are the dominating dailies in Peru, while **Variedades** is the **Saturday Evening Post** of that country; that one of the most effective forms of advertising in Argentina and Uruguay is railroad station advertising; that street car advertising in Rio de Janeiro, Sao Paulo, and Bahia, in Brazil, has been developed to a point where it is practically on a par with the best in this country; that the second most important daily, **Fanfulla**, in Sao Paulo, and **La Patria degli Italiani**, in Buenos Aires, are published in Italian; that **The West Coast Leader** of Lima, the **South Pacific Mail** of Valparaiso, and the **Herald** and **The Standard**, morning dailies, of Buenos Aires, all published in English, are advertising media of greater importance than their circulation would indicate; that anywhere from three to five dailies are published in cities of second and third size throughout all the republics, just as in this country, and that the only practical way to reach the people living in these cities is to advertise in the local newspapers, such as **La Capital** in Rosario, **Los Principios** of Cordoba, **La Nueva Provincia** in Bahia Blanca, **Los Andes** of Mendoza, and **La Gazetta** in Tucuman, all in Argentina; that poster and sign advertising is not advanced in several of the countries, while in some others it is well developed.

Revise Gasoline Specifications to Meet Commercial Needs

The former single standard, as adopted on Oct. 2, 1918, is being redrafted with three grades under consideration as the result of surveys made by the Bureau of Mines covering some 800 samples of commercial fuel—More uniform quality is needed in refining and marketing practice.

SLIGHTLY more than a year ago a committee on standardization of specifications for petroleum products was created by Presidential order to draw up specifications for use in making Government purchases. On Oct. 2, 1918, this committee adopted a specification for motor gasoline which has since been largely used by Government departments. Recently there have been complaints that the specifications no longer meet current conditions and the committee therefore requested the Bureau of Mines to consider the revision of the specification. The latter reads as follows:

Specification for Motor Gasoline

As Adopted by the Committee on Standardization of Petroleum Specifications, October 2, 1919

QUALITY—Gasoline to be high grade, refined, and free from water and all impurities, and shall have a vapor tension not greater than ten pounds per square inch at 100° F. temperature, same to be determined in accordance with the current "Rules and regulations for the transportation of explosives and other dangerous articles by freight," paragraph 1824 (k), as issued by the Interstate Commerce Commission.

Inspection and Tests

Inspection—Before acceptance the gasoline will be inspected. Samples of each lot will be taken at random. These samples immediately after drawing will be retained in a clean, absolutely tight, closed vessel and a sample for test taken from the mixture in this vessel directly into the test vessel.

Test—One hundred cubic centimeters will be taken as a test sample. The apparatus and method of conducting the distillation test shall be that described in Bureau of Mines Technical Paper No. 166, "Motor Gasoline":

(a) Boiling point must not be higher than 60° C. (140° F.).
(b) Twenty per cent of the sample must distill below 105° C. (221° F.).
(c) Forty-five per cent must distill below 135° C. (275° F.).
(d) Ninety per cent must distill below 180° C. (356° F.).
(e) The end or dry point of distillation must not be higher than 220° C. (428° F.).
(f) Not less than 95 per cent of the liquid will be recovered from the distillation.

This specification was drafted to cover Federal purchases of motor gasoline, both for domestic and for military uses, and represented a grade equivalent to a large proportion of the motor gasoline marketed in the calendar years 1917 and 1918. It has in addition been included in several state and municipal legislative acts regulating the sale and quality of gasoline. The specification has recently been criticized as too rigid for present refining and marketing practice, and it has been claimed that if all gasoline produced conformed to its requirements the nation's supply of motor fuel would be materially reduced.

To obtain information on this subject the Bureau of Mines has made a survey of the gasoline marketed throughout the entire country and has collected through its agents a total of over 800 samples, covering practically all the types of gasoline produced and sold. Samples have been obtained in all the states of the country and have included the production of all refineries of sufficient size to be of importance in the aggregate supply. The data collected in this survey are believed to be the most comprehensive now available with regard to the grades and quality of motor fuel.

The figures obtained through laboratory analysis of these samples have been studied to ascertain what proportion of the total number satisfied each requirement of the specification and what proportion satisfied all requirements. The following table shows results of this study:

Present Specification

Specification mark—	First drop	20%	45%	90%	Dry
Maximum distillation temperature—					
Degrees C.	60	105	135	180	220
Degrees F.	140	221	275	356	428
Per cent of samples tested satisfying each limit requirement	81.7	89.0	89.7	37.2	50.1

The limit on the temperature below which 90 per cent of the gasoline distilled was the most rigid and the number of samples meeting this requirement was notably less than that meeting any of the other points. As all samples satisfying the 90 per cent requirement did not satisfy all other requirements, it was found that the number passing the requirements for all the distillation marks was only 26.9 per cent of the total.

Two lines of action were then proposed. First, replacing the present specification by one (Grade M) that would allow approximately half the samples included in the present survey to pass, and that would not reduce the present supply if all gasolines were made under one specification. Second, drafting specifications for two grades of gasoline, one (Grade B) slightly more volatile than that represented by the present specification, the other (Grade R) covering a notably less volatile grade. The following specifications were drafted and studied in the same manner as before. The following tabulation shows the number of samples in the series collected by the Bureau of Mines satisfying each limit:

Government Standard Motor Gasoline
Grade M

Limit	Init.	20%	50%	90%	Dry
Degrees C.	60	105	140	190	225
Degrees F.	140	221	284	374	437
Per cent passing limit.	81.7	89.0	90.2	67.8	74.6

Percentage passing all requirements, 46.0%.

Government Standard Motor Gasoline
Grade B

Limit	Init.	20%	50%	90%	Dry
Degrees C.	60	105	140	180	215
Degrees F.	140	221	284	356	419
Per cent passing limit.	81.7	89.0	90.2	37.2	45.7

Percentage passing all requirements, 25.2%.

Government Standard Motor Gasoline
Grade R

Limit	Init.	20%	50%	90%	Dry
Degrees C.	65	110	150	210	235
Degrees F.	149	230	320	410	455
Per cent passing limit.	90.4	97.5	96.2	91.9	89.2

Percentage passing all requirements, 75.9%.

In drawing up the specifications, two changes of percentage limits were considered:

1. The 45 per cent point. It is customary in making laboratory distillations to read the temperature as each 10 per cent distills off, and for that reason the introduction of a requirement for 45 per cent means an additional reading and does not have any advantage over a 50 per cent requirement. Accordingly, the intermediate requirement has been changed from a temperature limit below which 45 per cent must distill to a temperature limit below which 50 per cent must distill. A study of the figures obtained by the analysis of over 800 samples shows that a requirement of 50 per cent distilling below 140 deg. C. (284 deg. F.) is equivalent to 135 deg. C. (275 deg. F.) for 45 per cent and the new specifications have been drawn up on this basis.

2. The initial point. Owing to difficulty in obtaining check results on initial boiling points it has been suggested that this point be left out of the specification and as a means of controlling the content of highly volatile material a temperature limit be fixed below which 5 per cent must distill off. From a laboratory standpoint the 5 per cent requirement is preferable, for it is difficult for different laboratories and different operators to check initial boiling points. However, the petroleum industry is familiar with initial boiling points and to specify a new requirement would cause considerable confusion; also it would be possible for products containing high percentages of benzol to satisfy the requirement for the 5 per cent point, although such products might have very little material boiling below 75 deg. C. and would not be satisfactory for use in cold weather.

Since the chief difficulty in getting check results in initial boiling point temperatures is caused by using various rates of heating, it is believed that standardizing the interval of time between the first application of heat to the flask and the time the first drop leaves the condenser, within rather narrow limits, will enable different operators to check initial boiling point temperatures. The standard method for the distillation of gasoline fixes the rate of heating after the distillation is started, but does not specify a definite length of time for obtaining the first drop, and as a result it is possible to vary as much as 5 deg. C. on first-drop temperatures, depending entirely on the rate of heating.

The Bureau of Mines is at present conducting experiments on the effect of the rate of heating on the temperatures of the initial boiling points, and will establish a standard method of determining this point, placing an upper and a lower time limit on the interval between the first application of heat and the time the first drop leaves the condenser. It is believed that when this method has been standardized a specification requirement for an initial boiling point will be satisfactory and a 5 per cent requirement will not be necessary.

The next question taken up was the actual loss in production under each of the four specifications, assuming that all of the high-grade gasolines now produced be kept as at present, and all the gasolines below the specifications be brought up to the specification requirements. The following results were obtained by a study of each of the 836 analyses, and the loss of production for each sample which did not pass the specification in question was determined. These losses were totaled, and the average loss of production determined for the specification. On this basis, Grade B would produce a loss of production of 4.51 per cent, the present specification a loss of 3.54 per cent, Grade M a loss of production of 2.25 per cent and Grade R a loss of production of .56 per cent. To check these figures a sample of low-grade gasoline was redistilled in a Hempel still, so that the resulting distillates would pass each of the specifications in turn. It was found that the calculated figures were very close to those obtained in the laboratory. As it is known that refinery practice can not equal laboratory efficiency, a refinery loss equal to the calculated loss was allowed.

On studying the 836 analyses it was found that the samples ranged in volatility from some that would almost pass the specification for "domestic aviation" gasoline to some that would not pass a specification even more lenient than Grade R. This is due to three things—first, to variation in the crude oils; second, to variations in refinery methods, and, third, to faulty distribution of casinghead gasoline and of the various gasoline fractions, some parts of the country having an excess of light fractions, and others having an excess of heavy ones. This condition would be remedied if all gasolines could be blended to a uniform standard. It is commercially possible to improve refinery practice in this regard, but even under the best conditions there would be some gasoline that would fail to pass any reasonable specification. In some cases there would be too much of the more volatile fractions, whereas in others there would be not enough. It is commercially impossible to get an entirely even distribution of all the fractions. If these gasolines were excluded, as would happen if the specification was rigidly enforced, a certain percentage of loss of production would result. This loss has been estimated as equal to the refinery loss. The resulting combined losses of production are as follows:

Domestic Production 1918

	Bbl.
Motor gasoline	70,000,000
Grade B=4.51×3=13.53 per cent	9,471,000*
Present grade=3.54×3=10.62 per cent	7,434,000*
Grade M=2.25×3=6.75 per cent	4,725,000*
Grade R=.56×3=1.18 per cent	826,000*

*Loss.

In the above work it was assumed that only the low-grade gasolines were to be changed. Obviously, if all the gasolines, both more and less volatile, were to be brought to the specification, the losses of production would be less. Accordingly, the average results of all the 836 samples were computed, first, as a straight average; second, by refining companies, allowing each of the large companies its proper weight according to its output, and, third, by consumption, each state being allowed its proper weight according to the percentage of automobile registrations. There three averages follow:

	Distillation results—836 samples				
	1st drop	20%	50%	90%	Dry
Straight average.....	51.6	95.0	127.2	183.2	217.0
Wtd. by production.....	48.1	95.6	128.8	185.9	216.6
Wtd. by consumption....	50.6	95.3	125.2	184.1	215.3
Average of 3 methods..	50.1	95.3	127.1	184.4	216.3
Maximum deviation from average	2.0	.3	1.9	1.5	1.0

It will be noted that there is very little difference in these three averages, so that the average of the three has been taken as a basis for computing losses or gains. Assuming that the three-method average represents the quality of the gasoline sold in the United States, and that all samples are brought to the specification, then

Grade B will produce a loss of 1.81 per cent.
Present grade will produce a loss of 1.81 per cent.
Grade M will produce a gain of 2.30 per cent.
Grade R will produce a gain of 10.50 per cent.

Assuming refinery and distribution losses as before:

Grade B=1.81×3=5.43 per cent loss.
Present grade=1.81×3=5.43 per cent loss.
Grade M=2.30×⅓=.77 per cent gain.
Grade R=10.50×⅓=3.50 per cent gain.

Specification M represents present refinery practice much more nearly than any of the other specifications. If all the gasolines produced, both more and less volatile, were brought to this standard, there would be a net gain of approximately 1 per cent in production. However, the present specification is producing enough gasoline for the present needs of the United States, although the theoretical loss, if this specification were rigidly adopted, would be approximately 5 per cent. Consequently, if specification M is adopted, and the same ratio of refinery practice to the theoretical practice is continued, the gain in production would be about 6 per cent. Inasmuch as the present production of gasoline appears to be sufficient at the present time, and allowance being made for the probable increase of production of high grade crude oil in the Texas field, for increased importations from Mexico and increased cracked gasoline, it is estimated that if specification M is adopted at the present time no change in the specification will be required for at least two years, and possibly not for three years.

The change from the present specification to Grade M will be more in the nature of a readjustment than a radical change. The present specification does not conform to good refinery practice in that there is too much difference between the 90 per cent point and the dry point. Also both these points are a little too low compared to the other points in the specification. This is very plainly brought out by drawing distillation curves of the present specification and of the average results of the 836 analyses. Raising the 90 per cent point from 180 deg. C. to 190 deg. and the end point from 220 deg. to 225 deg. remedies both of these faults and balances the specification. Consequently, if the present plan of a single specification is to be retained, Grade M should be adopted. The alternative plan is to have two specifications; one somewhat more rigid than the present and one decidedly less rigid. These are the "B" and "R" grades described above. Grade "B" would be like the present grade, but 5 per cent lower in end point. This change would tend to make a better balanced specification. Grade R would be less rigid all through the distillation range and would approximate in quality a large amount of gasoline now used and sold in the Middle West. The arguments in favor of the two specifications plan are that it would allow of conservation of the higher-grade material for military use, winter use, and other special purposes, and that it would allow of a large increase in the production of gasoline. Inasmuch as there is already one high-grade gasoline now available—namely, "domestic aviation"—it seems unnecessary to specify a grade any better than the present grade for the special uses mentioned above. And, as already stated, the adoption of Grade M is not likely to cause any restriction of output for some time to come. The arguments against the two specifications plan are that it adds confusion to the gasoline market, and that a number of dealers would find it necessary to carry two grades, with consequent increase of storage capacity. Considering the matter from all sides, the Bureau of Mines is in favor of adopting the single specification plan (Grade M).

In conclusion, one thing more can be said. There is at present a great lack of uniformity in refining and marketing practice as regards quality. This is evident from a study of the figures presented. For instance, only 46 per cent of the samples tested passed the "M" specification at all points and yet if this specification was rigidly enforced and all the motor gasoline produced in the United States was blended into a uniform product, it would be well under all the limits. This shows that the 46 per cent of samples that passed are enough more volatile than the specification to more than balance the 54 per cent that are less volatile, and a detailed study of the individual samples confirms this.

This situation should be corrected. If the gasolines of the United States are made more nearly uniform, the consumer can get greater economy in actual use, and thus tend to conserve the available supply, and the use of one specification more rigidly enforced would be one method of accomplishing this result.

Action on the Specifications

WASHINGTON, Oct. 4—Recommendations for revision of the motor gasoline specifications, with the raising of the 90 per cent limit and the omission of all references to specific gravity from petroleum product specifications were the chief suggestions made at a meeting here this week at the Bureau of Mines, Department of Interior, to the Technical Subcommittee on Standardization of Specifications for Petroleum Products. It was strongly urged that more co-operation is needed between the oil and the automotive industries to insure better utilization of petroleum products and to avoid economic wastes that now occur in both industries. The recommendations for revising specifications of motor gasoline were referred to the Presidential Committee on Standardization of Specifications for Petroleum Products.

The Technical Subcommittee comprises Dr. G. W. Gray, chairman; A. W. Kramer, representing the Bureau of Standards; H. H. Hill, representing the Bureau of Mines; Doctor McDonell of the Railroad Administration, Commander Stuart of the Navy, and Captain Sanderson of the Army.

IN connection with the investigation of lubricating oils, a member of the staff of the Bureau of Standards attended a meeting of oil refiners and consumers and members of the American Society for Testing Materials, recently held in Canada. The general opinion at this meeting was that particular attention should be paid to simplicity of apparatus and methods of test adopted as a standard. It appeared that test methods were now sufficiently standardized to warrant the Society for Testing Materials in making a start toward the writing of satisfactory specifications for lubricating oils. Quite a large number of inquiries have been received concerning details of the test methods in use and for explanation of certain features of the various government specifications for lubricants.

The Daimler Post-War English Truck Chassis

A Knight sleeve valve engine and Lanchester worm gear are outstanding features of the 2-ton model on which the Daimler Co. will specialize. The interesting specifications of this truck, one of the few new mechanical creations of the British makers since the war, are given in detail by Mr. Bourdon.

By M. W. Bourdon*

THAT well-known British firm, the Daimler Co., Ltd., of Coventry, England, has decided to specialize on one type of truck, the 2-ton capacity chassis, with a four-cylinder Daimler-Knight sleeve valve engine. The chassis is being made, however, in two lengths, the short model having a wheel base of 138 in. and the other a wheel base of 162 in. The short model is intended for trucks, and the long one for a chars-a-bancs—for which there is a great demand in England at present—and for single deck buses, although it also is being supplied for goods transport where the freight is of a bulky nature.

The bore and stroke of the engine are respectively 3¾ x 5½ in. (95 x 140 mm.); the cubic capacity is therefore 240 in. The normal speed of revolution is 1,000 rpm., at which speed the bhp. developed is 30.

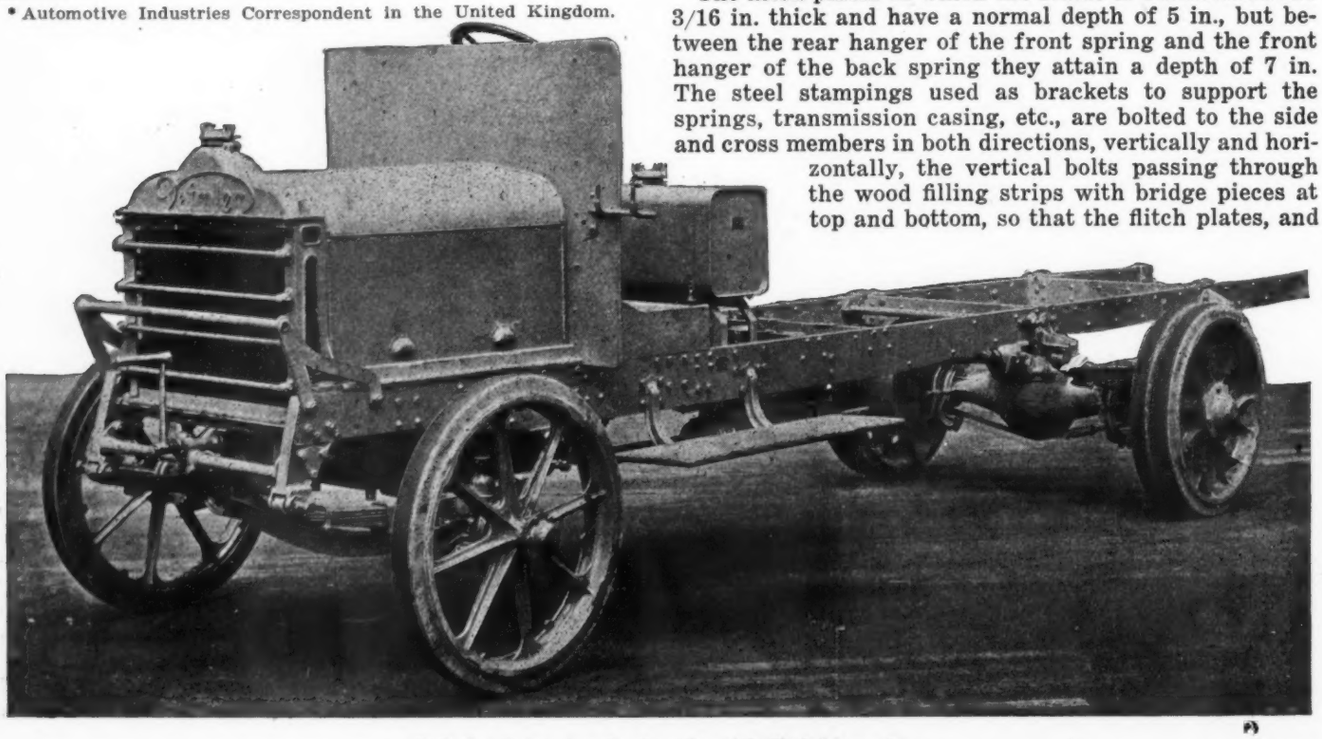
The engine is suspended from the frame in an unusual manner. There are two pressed steel bridge pieces forming cross members of the frame, and, below these, the engine is hung by means of four ⅞ in. diameter bolts.

Another particular in which the chassis departs from the usual present-day practice is in the main frame members, each of which, instead of being of channel section pressed steel, consists of two flitch plates with wood between, the three units being riveted together, while the two side members are united at several points by cross members of the same type.

For this type of frame, it is claimed that a lighter construction is obtained, and one that is better able by its inherent flexibility to stand up to the shocks imposed by use on rough and uneven road surfaces. As it is impossible, or at any rate inadvisable, to make a frame that is positively rigid, a flexible basis is aimed at and allowance for the effects of this are made in the mounting and connection of the chassis units.

The flitch plates of which the frame is constructed are 3/16 in. thick and have a normal depth of 5 in., but between the rear hanger of the front spring and the front hanger of the back spring they attain a depth of 7 in. The steel stampings used as brackets to support the springs, transmission casing, etc., are bolted to the side and cross members in both directions, vertically and horizontally, the vertical bolts passing through the wood filling strips with bridge pieces at top and bottom, so that the flitch plates, and

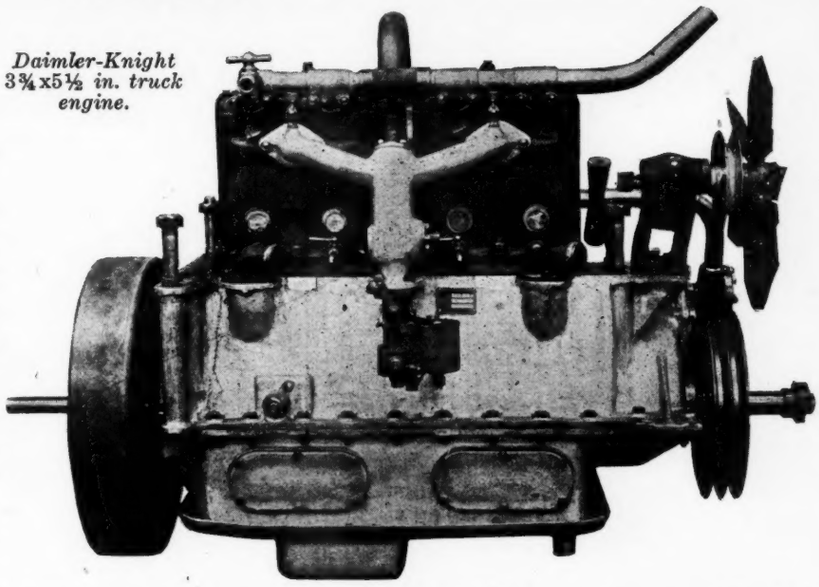
* Automotive Industries Correspondent in the United Kingdom.



Daimler 2-ton truck chassis with Knight engine.

not the wood, are clamped securely together.

In regard to the engine construction, the usual cast iron valve sleeves are in evidence, with pistons of the same material having deep convex heads. Three rings are fitted above the piston pin, the latter being ⅞ in. in diameter, hollow, and prevented from moving endwise and from rotating by means of a fourth ring passing through grooves in the ends of the pin. The crankshaft, which has pins of 52 mm. diameter and three main bearings of the same size, drives the valve shaft by means of a silent chain at the front end, while, from the valve shaft, another chain drives the magneto shaft arranged on the left side of the crank case. A forward extension of the latter shaft drives the water pump through a leather disk coupling.



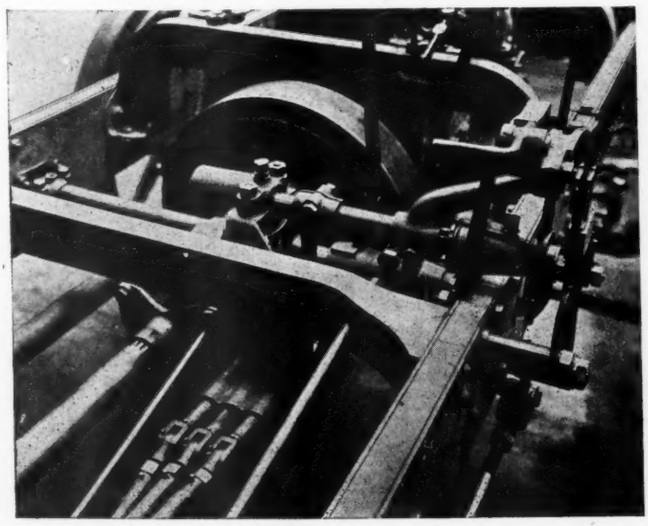
Daimler-Knight 3¾x5½ in. truck engine.

The lubrication is on the splash system, with a hinged trough under each big-end, the free ends of the troughs being linked to the throttle control and raised as the throttle is opened. The oil pump consists of six plungers reciprocating within the same number of bores in an integral pump casing. The plungers are operated by a small connecting rod from a crank pin on the valve shaft, and drive the oil through a single lead with branches to the troughs. Suction and delivery of this sextuple pump are controlled by an oscillating valve operated by another small connecting rod from the valve shaft. The pump is not submerged but draws the lubricant from within a large cylindrical strainer arranged at the bottom of the sump.

To prevent oil drippings on to the road, the crank case has a wide guttering formed outside and nearly all around, this taking the place of an under-pan. The same system is also applied to the transmission casing and its effectiveness is proved by the fact that it meets with the strict requirements of the London police authorities who will not permit any public service vehicle to run if it allows oil to leak and drip on to the roadway.

The Driving Mechanism

At the front end of the crankshaft, beyond the distribution casing, is a 12-in. diameter dual pulley. The front groove drives the ball-bearing fan behind the radiator by means of a V-belt, while the second groove is provided for driving a dynamo if electric lighting—which is not included in the standard equipment—be specified by the purchaser. The fan shaft has, for the adjustment of the belt, an eccentric mounting within a bracket standing up from the top of the distribution case, the shaft having, in addition to two journal ball-bearings, a ball-bearing thrust washer.



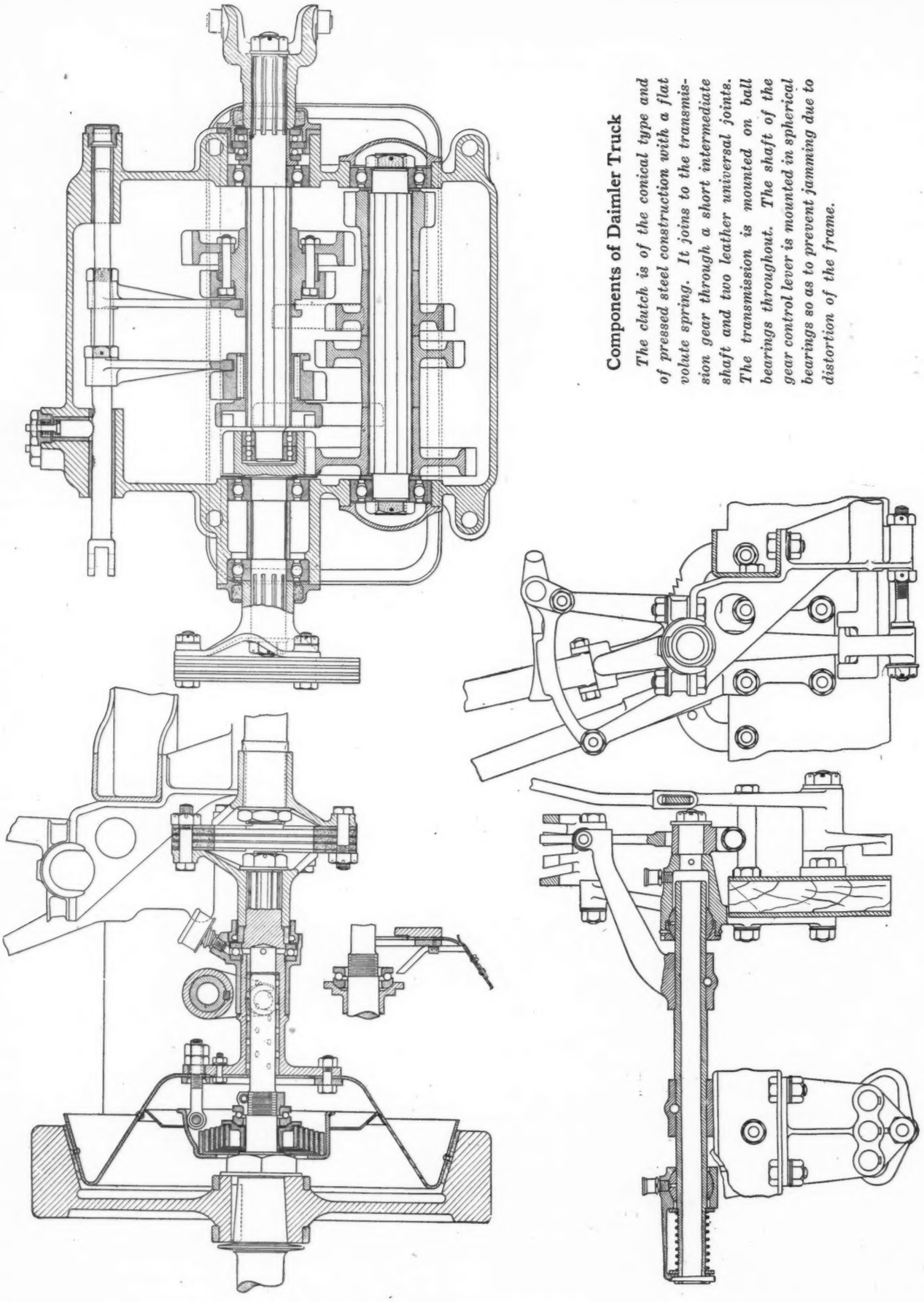
Control mechanism.

The Drive

The drive is taken from the flywheel by a fabric covered cone clutch, notable features of which are the use of an involute spring formed from flat section steel and a steel pressing for the driven member. The latter is bolted to a flange on the hollow clutch shaft, which is supported from the crankshaft extension by a plain pilot bearing 4¼ in. long. At each end of the coupling shaft, between the clutch and gear box, is a leather flexible joint consisting of three disks 8 in. in diameter. On this coupling shaft also is a drum 8⅝ in. in diameter and 2¼ in. wide, which forms the rotating member of a clutch shaft brake. Applying to the lower half of this drum is a band brake shoe, fabric lined, which is raised by a linkage and presses against the drum when the clutch pedal is operated.

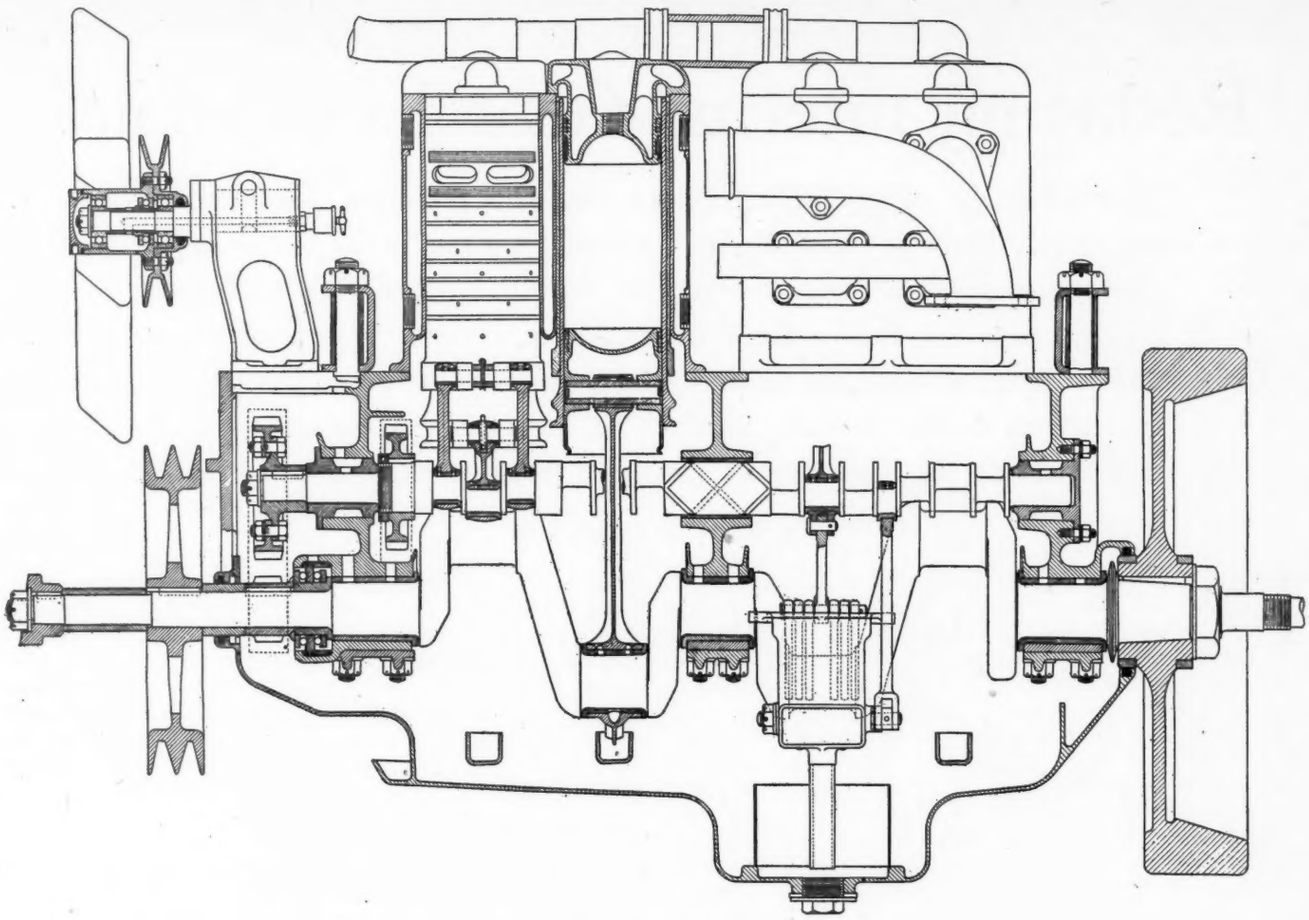
The transmission casing contains gears giving four speeds and a reverse, the latter being engaged by sliding endwise a short shaft located at the bottom of the box and bearing two pinions. The lever which moves this shaft is arranged outside the box, although the forks taking effect upon the forward drive gears are inside, as is usual in selective type transmissions. All the selector shafts are copper coated, the idea being to preserve them from rust where they are exposed outside the box. The transmission shafts, except that on which the reverse pinions are mounted, run on ball-bearings. This applies also to the pilot bearing, which has two ball journals side by side. At the rear end of the driven shaft is a double thrust washer. All the shafts are splined. This applies practically throughout the chassis, the only important exception being the flywheel mounting on the crankshaft, which consists of a taper and feather key, locked, of course, by a nut.

Behind the transmission casing, at each end of the tubular propeller shaft, is a universal joint of the star type encased in a cast steel housing, the requisite sliding motion being obtained on the splining of the shaft ends. The pins of the joints work in double row Skefko radial ball-bearing.



Components of Daimler Truck

The clutch is of the conical type and of pressed steel construction with a flat volute spring. It joins to the transmission gear through a short intermediate shaft and two leather universal joints. The transmission is mounted on ball bearings throughout. The shaft of the gear control lever is mounted in spherical bearings so as to prevent jamming due to distortion of the frame.



Sectional view of Knight engine.

The final drive is by a Lanchester overhead worm with a ration of 7¼ to 1. The worm and worm whele are both supported from the circular flanged cover plate of the rear axle casing, the center lines of the worm and wheel thus being independent of the machining of two separate units, while the worm and its wheel can, when occasion arises, be withdrawn complete as a unit, without disturbing any other part except the solid driving shafts.

The rear axle casing consists of a cast steel center tapering on each side to flanges to which are bolted cast extensions, the latter having formed in one piece with them the brake drum cover plates and spring mountings. The rear springs form both torque and radius members, being shackled only at the back end and fixed to the axle extensions. Both brakes operate within 16 in. diameter drums on the rear wheels and are provided with a compensating device in their linkage with pedal and lever. A commendable feature is the provision of detachable hardened steel plates on the ends of the brake shoes, so that when wear of plates and cams has occurred the former can be cheaply and easily renewed. The back axle is of the full floating type, the rear wheels running on Timken roller bearings.

Controls consist of the usual clutch and brake pedals, with a throttle pedal arranged between them. On the dashboard also is a screw throttle stop which prevents the pedal rising above a pre-determined point. The gear lever is hinged below the gate and takes effect upon a laterally sliding shaft which is mounted in spherical bearing housings to prevent any binding effect resulting from frame distortion. The safety catch guarding the reverse slot consists of a heavy hinged piece, which the driver can raise by applying his right foot to its rearward

Following are a few details and dimensions:

Weight: short chassis, 5550 lb.; long, 5660 lb.
Wheel track: both types, 63 in.
Minimum ground clearance 9½ in.
Turning circle: short chassis, 46 ft.; long, 52 ft. 6 in.
Tires: 900 x 100 mm. (36 x 4 in.), single front, twin back.
Fuel system, gravity feed.

Deterioration of Unvulcanized Rubber Under Light

THe injurious effects of sunlight on vulcanized rubber are already well known, but it has recently been proven by experiments reported by R. Repony in "Rubber Age" that there is a similar effect on unvulcanized rubber compounds. A mixture of 40 per cent of fine Para rubber and 60 per cent of mineral filler after being calendered and exposed to sunlight for 2 hours in July had completely lost its surface tackiness and this could not be restored even by moistening with gasoline; also two layers when vulcanized with the oxidized surfaces pressed together failed to become united.

Experiments with rubber placed between plates of glass of various colors, with almost complete exclusion of air, indicated that light is a more important factor than air or heat in producing the alteration in question. Rubber mixings containing a high percentage of mineral fillers, especially oxides, are more affected than those rich in rubber, and pure rubber free from sulphur is least sensitive. Although the presence of paraffin wax, mineral oil, or other non-drying oils retards the oxidizing action of light the best precaution is to protect mixed rubber stock from direct exposure to the sun's rays.

Reducing Internal Gear Limitations

The adoption of straight line profiles for the gear teeth, with the teeth having curved conjugated profiles, does away with some undesirable features of the involute system, Mr. Trautschold says in this article descriptive of the Williams gear. The subject is discussed particularly in its relation to the manufacture of motor trucks, as the use for internal gears in such construction is thought to promise wide-spread possibilities.

By Reginald Trautschold

THE fact that approximately 25 per cent of all models of motor trucks of ¾ ton capacity and up are being constructed with some type of internal gear for the final speed reduction proves pretty conclusively that the advantages of the dead axle construction have been well demonstrated and are being more generally recognized than would have seemed possible only a few years ago. Greater road clearance, more economic consumption of power—due to the driving force being applied nearer the periphery of the wheels—a reduced starting effort and considerably greater strength are realized by the construction, any one of which is an improvement much to be desired and in the aggregate improvements which would indicate a coming general use of internal gear drives as extensive as the former propulsion by means of chains. In fact, so widespread promises to be the demand for internal gears for motor truck drives that any improvement in internal gear design is of particular interest at the present time.

Internal gears until quite recently have been proportioned according to the involute system of gearing—at least all internal gears employed in motor truck construction. These gears, however, on account of inherent limitations of the involute system, do not have teeth with profiles of true involute form, but with curved profiles that depart from the involute for the greater part of the depth of the teeth. Such modifications are necessary in order that the internal gear tooth spaces may accommodate the teeth of the mating pinion, the profiles of which are of more or less involuted form, for otherwise the pinion teeth would "foul" with the internal gear teeth—i. e., serious interference of teeth would result. In other words, the interchangeability, the distinctive peculiarity which the involute system of gearing is supposed to possess, has to be sacrificed in large measure in the practical construction of so-called involute internal gearing.

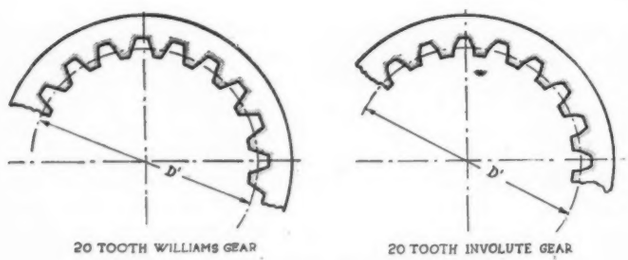


Fig. 1—Comparison of internal gears.

This point is emphasized to forestall the common argument that the involute system is essential in commercial manufacture, owing to the fact that the members of a combination may be changed without destroying the efficiency of the train. An involute internal gear generated to operate with a specific size of pinion is a special gear which will not operate as effectively with any other size of pinion. It is "interchangeable" to only a limited extent.

The Involute System

In the simplest form of the involute system, the rack, the profiles of the teeth resolve into straight lines, forming the simplest and most easily reproduced form of tooth. In external gearing, the tooth profiles become convex curves and in internal, concave. Obviously the external form of gearing (involute) tends to reduce interference of meshing teeth, while the internal form increases the liability, for interference will occur between the teeth of an involute rack and pinion if the point of first tooth contact lies inside the rack addendum line.

To reduce interference with internal gears of involute form the profiles toward the tops of the teeth are cut away—destroying whatever may be the advantages of the involute curve for the gear teeth. This necessary modification, however, does not reduce the "undercutting" which is common to gears of a relatively small number of teeth, so that in the involute system the minimum number of teeth for the pinion is limited to ten or twelve.

These limitations of the involute system cannot fail to have an ill effect upon the efficiency of internal gearing of involute form for motor truck drives. In the first place, the involute form of internal gear tooth is not feasible, as a rule, doing away with true interchangeability, and, what is more serious, destroying or reducing the contact between the internal gear teeth and the more truly involuted form of pinion tooth. Then, undercutting limits the use of small pinions by making it imperative for the pinion to have at least ten or twelve teeth. Even with such a number of teeth, the individual teeth of the pinion are relatively weak—on account of the unavoidable undercutting—so there is a decided limitation imposed in the matter of strength. Finally, comparatively fine pitches have to be employed in order to secure even the relatively low ratios of speed reduction possible in the limited space allowed for the gearing in a motor truck. The foregoing are mechanical shortcomings of the involute system of internal gearing, in addi-

tion to which there are a number of economic disadvantages that would tend to retard the general adoption of the internal gear drive.

The cost of gears depends in large measure upon the number of teeth they carry, fine pitch gears costing considerably more than gears of coarser pitch. The relatively large number of teeth an involute pinion must possess necessitates the use of an unduly fine pitch, in order to keep the diameter of the internal gear within the limits set by available space in a motor truck drive. The cost of the internal gearing is, therefore considerably higher than it would be if a pinion with fewer teeth could be employed. Such a pinion, were it feasible, would permit the use of a coarser pitch—cheapening the cost of the gears—or enable a higher speed ratio to be employed.

Yet, despite these marked limitations of the involute form of internal gearing and some even more pronounced limitations—reference to which will be made subsequently—the internal gear drive for motor trucks has apparently proved highly desirable. If the limitations could be removed or reduced, it would seem highly probable that the internal gear drive would become the recognized standard for motor truck propulsion.

The Williams Gear

The Williams internal gear, now being introduced commercially, does just this. It possesses the advantages of the internal form of gearing in an accentuated degree, and the limitations of the involute system are materially reduced in this simpler form of mechanism. The radical departure from other systems of gearing that makes such improvements possible is the adoption of straight line profiles for the internal gear teeth and teeth of curved conjugate profile for the pinion generated to run with the internal gear. This distinctive innovation in spur gear design secures for the new system not only a very material improvement in the features so positively limited in the involute system, but a number of inherent advantages that give to the gearing a much longer arc of contact, improve its operating action, reduce wear and increase the strength of the pinion teeth. Gear combinations in which the pinion has considerably fewer teeth than are feasible or practical in the involute system can be generated successfully and the compactness thus attainable makes possible the use of coarser pitches and the securing of higher speed ratios for simple gear combinations without the diameter of the internal gear exceeding practical dimensions.

Production costs are very materially less than those entailed in generating internal gears according to the involute system, and the accuracy with which the teeth can be reproduced is much greater. No modifications of tooth profiles is necessary, for the pinions are generated, or cut with generated "formed tools," to run with their particular form of internal gear. If the pinion can be generated, and the conjugate of any form of gear tooth can be generated, it will run with its mating gear without interference or modification of profile.

Arcs of Contact

The length of the arc of contact between meshing teeth is a measure of the efficiency with which power may be transmitted by tooth gearing, for the longer the teeth are in actual contact the more effectively is the load distributed and transferred from gear to pinion, or from pinion to gear. In this important respect the Williams system is superior to the involute. The arc is controlled by the length of the usable section of the path of point of contact, which in the involute system is a straight line passing through the instant axis of the gears, while in the Williams system it is a curve passing through the same point of common tangency.

The curved path of point of contact which distinguishes the Williams system is, to all intents and purposes, the arc of a circle passing through the instantaneous axis and having a diameter equal to the length of a straight line extending from the instantaneous axis to the circumference of the circle to which the profiles of all the internal gear teeth are tangent, and its center at the mid-point of such line of tangency. The section of this path of point of contact which can be employed—the usable path of point of contact—is the arc embraced between a plane passing through the centers of the circle generating such path and that of the pinion and a plane in which lie the centers of the

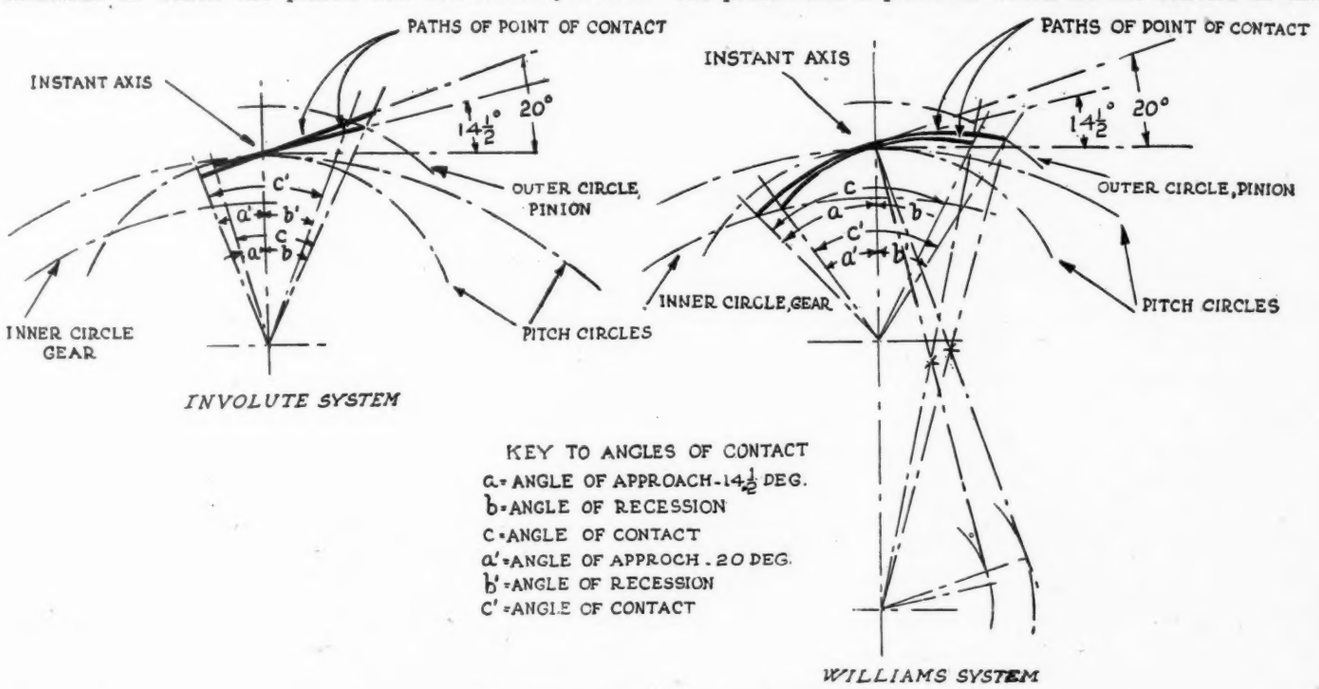


Fig. 2—Comparison of arcs of contact.

internal gear and of the generating circle. It is rarely, however, that the entire usable path of point of contact can be made of service in practical commercial gearing, for the depth of the gear teeth also limits the length of the arc of contact. The intersection of the path of point of contact with the inner diameter of the gear establishes the point at which contact of teeth can commence, while the intersection of the path of point of contact with the outer diameter of the pinion marks the point of contact termination. When these limiting points set by the proportions of the gearing fall within the usable path of point of contact they mark the actual commencement of the angle of approach or termination of angle of recession—as the case may be.

In the involute system, the path of point of contact is traced by a straight line inclined to the common tangent plane of the gear and pinion at the angularity of the direction of pressure—i. e., the pressure angle. The angle of approach is thus definitely limited to an equality with the pressure angle, for contact can only occur normally between engaging teeth. The angle of recession is limited, as in the case of the Williams construction, by the intersection of the path of point of contact with the outer diameter of the pinion. It is, however, considerably less than in the newer design, for the curved path, after passing the instantaneous axis, curves toward the circumference of the pinion and so delays its intersection with the outer diameter. Similarly, the path of approach in the Williams construction is lengthened by the curvature of the path of point of contact toward the center of the pinion.

The difference in the lengths of arcs of contact for the two systems is plainly illustrated by the diagrammatic outlines shown in Fig. 2. These diagrams depict angles of approach, recession and contact—the latter the sum of the first two—for 14½ and 20 deg. involute teeth and

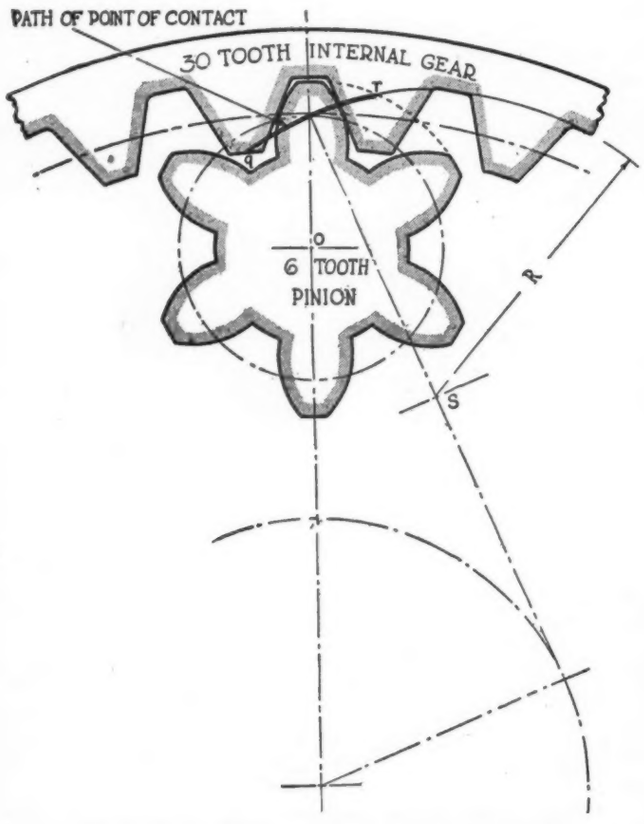


Fig. 3—5:1 Williams internal gear combination.

Williams teeth of corresponding obliquity at the instantaneous center. In the involute system, it will be noted, an increase in the pressure angle increases the angle of approach but shortens the angle of recession, the result being, however, a slight increase in the angle of contact. In the Williams system, an increase in the angularity of the direction of pressure tends to decrease the angle of advance and increase the angle of recession so that the ratios of the respective angles of contact are not materially affected.

Another point that should be noted is that the curvature of the Williams path of point of contact brings the point of first contact lower on the flank of the pinion tooth, with the result that the load is applied with a reduced leverage.

The importance of these distinctive advantages of the Williams construction is well illustrated in the gear layout shown in Fig. 3. The combination—a 5 to 1 reduction—is, in the first place, quite feasible with Williams gears, though quite impractical with involute gears—on account of the limitations which prevent the successful generation of a practical involute pinion with only six teeth. Assuming, however, that an involute gear combination of similar ratio was feasible, the angle of approach secured by the Williams system could not be equaled with involute gears, unless the pressure angle were increased to something like 35 deg. If such a pressure angle were feasible, the angle of recession would only be about two-thirds that secured by the Williams construction, so that a similar arc of contact would be quite unattainable with gears of involute form—even if an involute combination in which the pinion had only six teeth could be successfully generated.

Wear

The longer arc of contact in the Williams system means more teeth in action at the same time and so a greater distribution of load than is possible with gears having teeth of involute form. With the load per individual tooth reduced and a longer path of action, wear is evidently materially reduced. Another distinctive peculiarity of the Williams gears which reduces the weakening effect of wear is that contact commences lower on the flank of the pinion tooth than in the involute system, so there is a greater profile area over which to distribute the wear.

Another peculiarity of the Williams construction is that such concentration of wear as does take place over the profiles of the teeth occurs in both pinion and gear toward the root of the teeth, where the destructive effect of wear can best be withstood, with the result that a slight relief is thus secured that tends to ease off the shock of initial contact and produce quieter and smoother operating gears.

Strength.

The strength of a gear combination being no greater than that of its weakest member—the pinion—the form of the pinion tooth is extremely important. A pinion in a truck drive should be unusually strong and the undercutting of pinion teeth, so marked if they are proportioned according to the involute system, should be avoided so far as possible. In the Williams system the undercutting is much less serious than in the involute and this can probably be most clearly demonstrated by a comparison of the tooth spaces of the internal gear.

The concave profiles of the involute internal gear teeth reduce both the top and bottom widths of the tooth spaces, if the profiles of the gear teeth are of involute form. The involute pinion teeth have to accommodate themselves to such confined space, even should the profiles of the internal gear be modified to avoid "fouling"

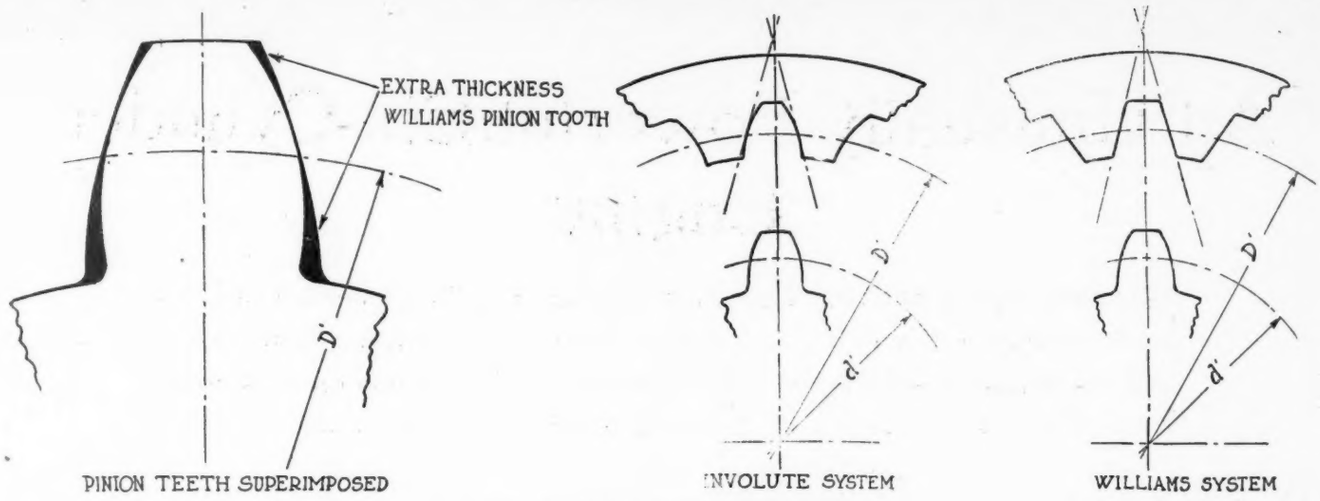


Fig. 4—Pinion teeth superimposed.

of engaging teeth, so the top and root thicknesses of the involute pinion are correspondingly reduced. In the Williams construction, the profiles of the internal gear teeth are straight, giving a wider top and root space for the accommodation of the mating pinion tooth. The result is that, compared to involute pinion teeth of the same proportions, there is considerable extra thickness to the top and root of the Williams pinion tooth. This is well illustrated in Fig. 4, where—in the larger diagram—involute and Williams pinion teeth of the same proportions are superimposed. The extra root thickness of the Williams pinion, in the case illustrated, makes it about 36 per cent stronger than the involute pinion tooth with which it is comparable—the strength of the respective teeth varying as the square of their root thicknesses. This particular comparison favors the involute construction; furthermore, as the teeth are proportioned for 12 tooth pinions with 20 degrees obliquity and of 80 per cent stub form, if the teeth were of lesser obliquity or of standard depth, the comparative strength of the Williams pinion would be much more marked, or if the pinion had fewer teeth.

This latest contribution of Harvey D. Williams' creative mind should prove more valuable to the automobile industry than his improved form of bevel gearing, now adopted by the Packard Motor Company.

Possibilities of the Diesel Engine

IN the discussion of a paper on the Diesel engine before the Institution of Automobile Engineers in London recently, D. M. Shannon said that he had seen in Germany a small 5 b. hp. engine running at 700 r. p. m. Five days before the outbreak of the war, he saw trials of a 12,000 bhp. two cycle engine in the same country, and it was understood that, as soon as conditions permitted, the Germans were prepared to accept orders for engines up to 6,000 hp. in one unit.

Discussing the adaptability of the Diesel engine to automotive work, Shannon, in a communication to the Institution, says that

"There is no reason why the Diesel engine should not have a range of speed as wide as or wider than that of the gasoline engine. Roughly speaking, in the latter the limit of speed is reached when the gasoline-air mixture becomes too weak to fire, while there is no such limiting factor with the Diesel engine, nor can the cooling effect during slow compression be said to be the limiting factor. At slow speeds leakage past the piston is serious, but not so serious as the increased quantity of injection air allowed to go into the cylinder. At low speeds less fuel is blown into the cylinder and a larger proportion of air will go in with it, while the valve is also open for a longer time, and as the time-area through it increases inversely as the speed, a further increase in the injection air consumption takes place. As the temperature of this air is well below freezing point, there comes a speed at which the volume of injection air admitted to the cylinder is such as to reduce the temperature of the air in the cylinder below ignition point and the engine stops firing.

This defect can obviously be overcome by reducing the valve lift as the engine speed is reduced, so as to keep the proportion of injection air to fuel oil constant at all speeds. This is now common Continental practice and should be embodied on all modern engines.

Again, as the speed goes down the kinetic energy in the flywheel and moving parts decreases, and, as the positive work being done is also a minimum, there comes a point at which the negative work (during compression) being done exceeds the positive and the engine blocks itself and stops. This, of course, can be improved by a correctly proportioned flywheel or by the application of Prof. Watkinson's constant compression ratio device, in the case of four-cycle engines.

AN investigation of the structure of fish skin leather has been started by the Bureau of Standards and will probably continue for several months at least. It is hoped that it will result in the discovery of a quick method of distinguishing fish skin leather from animal leather. In this work, the Bureau is co-operating with the Bureau of Fisheries, which will supply the material for test. Quite an extensive field exists for the use of leather of this kind, though there should be some simple method for determining whether a particular leather has been made from fish or animal skin.

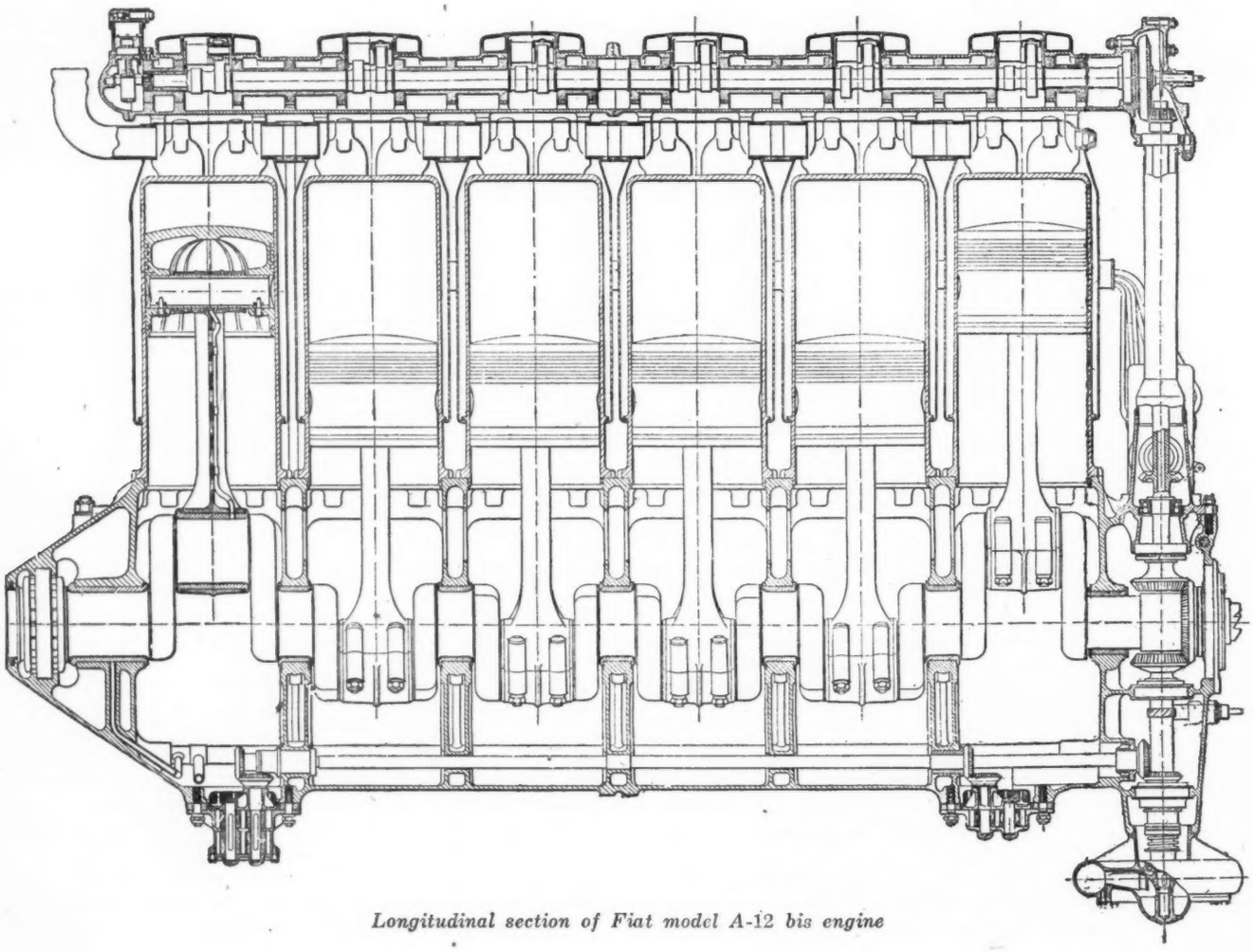
An Unusually Powerful Six-Cylinder Engine

This Fiat engine, built for aircraft during the war, is a splendid piece of workmanship and is well worth study. It includes some automobile ideas and will attract more attention than is usual for the war emergency design. Especially is the selection of materials worthy of consideration.

THE well known Fiat automobile concern of Turin, Italy, during the war produced a series of aircraft engines of constantly increasing power. One of their most extensively used models is the No. A-12 bis (as they call it in their French instruction book), which has a cylinder bore of 160 mm. and a stroke of 180 mm. (6.30 x 7.09 in.). At the normal speed of 1600 r.p.m. this engine develops 300 hp., and at its maximum speed of 1800 r.p.m. it develops 320 hp.

Following is the timing of the valves and ignition: Inlet valves open 10 deg. past top dead-center and close 50 deg. past bottom dead-center; exhaust valves open 45 deg. ahead of bottom dead-center and close 15 deg. past top dead-center. The magneto on the inlet side is timed to give a maximum spark advance of 32 deg. and that on the exhaust side is timed to give an advance of 35 deg.

The cylinders, including the water jackets, are made singly of steel. Four steel poppet valves are fitted into each cylinder head; these are arranged at a slight angle relative to the cylinder axis, and the valve stems slide in bronze bushings pressed into the valve stem guides, which form a part of the combustion chamber. The water inlet and outlet bosses are welded to the cylinder block by means of the oxyacetylene flame. For draining the cooling sys-



Longitudinal section of Fiat model A-12 bis engine

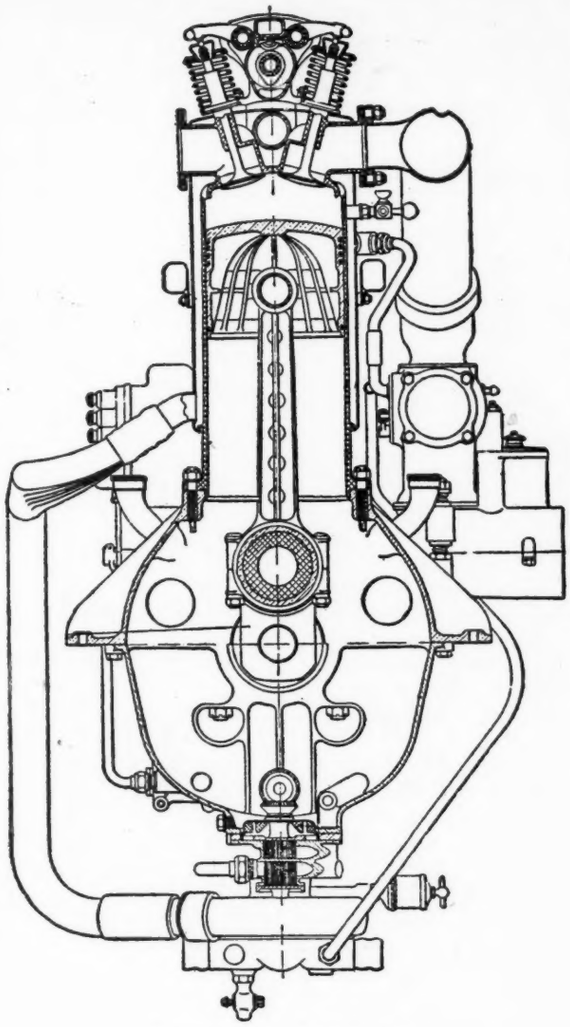
tem there is provided a draincock at the bottom of the centrifugal water pump.

The valves are actuated by means of rock levers, which in turn are operated by the camshaft. The latter is located on top of the cylinders, extending the whole length of the engine, and is protected by a bronze housing fitted with removable, oil-tight covers.

The camshaft is operated from the crankshaft by means of two pairs of bevel gears at the bottom and top of a vertical shaft, supported by ball-bearings. The vertical shaft also carries a bevel gear for driving the magnetos, the drive being through two driven gears and two small shafts.

The pistons, made from a special aluminum alloy, are fitted with four compression rings at their upper end and one oil scraper ring at the bottom. The piston pin, which is hardened and ground, affords a large bearing surface.

Connecting rods are of chrome-nickel steel. They are fitted with drawn, high-tensile bronze bushings at the upper end, and with a bronze back, white metal lined bearing at the lower. Fitted to the shank of the connecting rod is a small copper tube which carries oil from the crankshaft to the piston pin bearing.

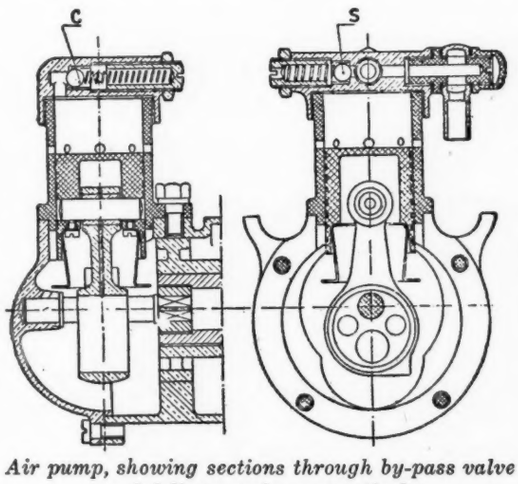


Cross section of Fiat engine

The crankshaft, of chrome-nickel steel, has six throws and seven journals. These latter are supported in bronze back, white metal-lined bearings, which are enclosed between the upper and lower halves of the crankcase. To the forward end of the crankshaft is secured a bevel pinion which drives the vertical shaft from which the camshaft is driven, and also a short vertical shaft below the crankshaft which drives the oil and water pumps. Beyond the pinion referred to, there is a ratchet clutch by means of which the engine is cranked by hand.

The rear end of the crankshaft terminates in a tapered section, which carries a key for the propeller hub. The thrust of the propeller is taken up by a set of ball double thrust bearings, which are mounted in a recess cut in the upper and lower halves of the crankcase.

The aluminum crankcase is cast with eight supporting arms, by which the engine is carried on the engine bearers. It is also fitted with breathers with detachable caps. At the forward end of the engine are formed the two magneto brackets, as well as the housing for the gears which drive the camshaft, which is closed by a cover plate serving as the support for the thrust bearing of the crankshaft pinion. The aluminum crankcase carries the oil pumps and oil-distributing piping as well as the longitudinal shaft which operates these pumps and the water pump.



Air pump, showing sections through by-pass valve and delivery valve respectively

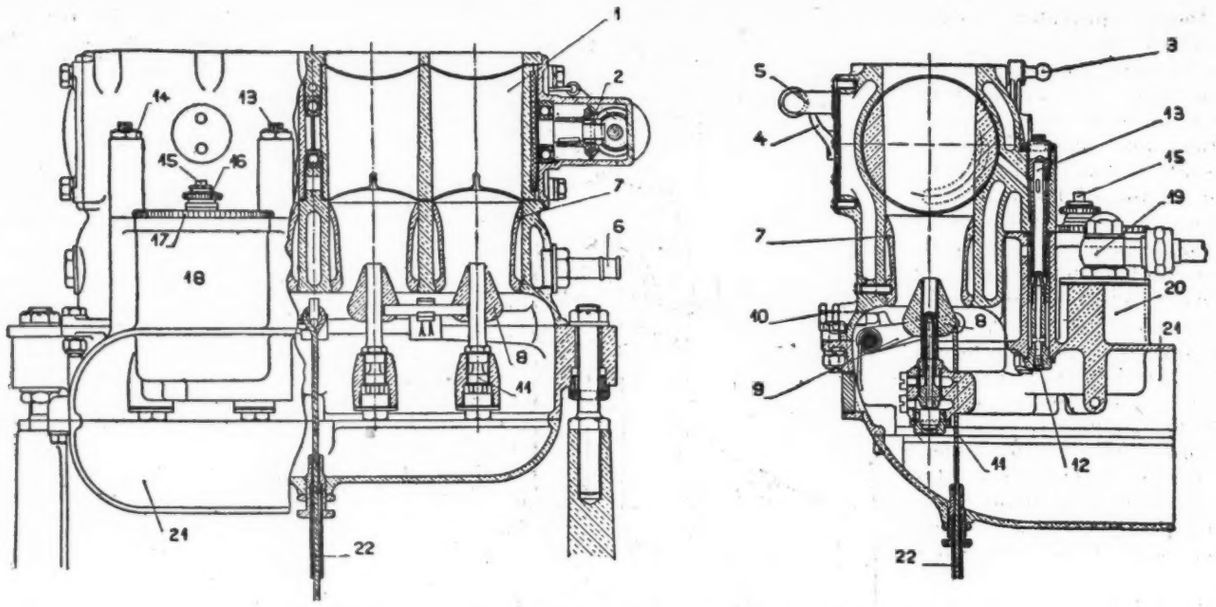
Two carbureters are used with each engine. Two successive models have been used. One, with the first series of engines, had four vertical cylindrical throttle valves. Each of the carbureters supplies one group of three cylinders and possesses two spray nozzles of different diameters, for low speed and high speed operation respectively. The two mixing chambers are enclosed within a single water jacket, which permits of the circulation of hot water direct from the cylinder jackets. The main spray nozzle is provided with an arrangement for regulating the rate of gasoline feed at high altitude, when the mixture becomes too rich.

The pre-heating of the mixture (which may be regulated by means of a valve inserted in the tube through which the water enters the carbureter jacket) is necessary in order to obtain regular operation, especially at very low temperatures.

The carbureter is provided with a separate air intake for the small spray nozzle, which, when the low speed operation is irregular, may be adjusted by means of a screw and lock nut located at the side of each float chamber. By turning this screw left handedly air is admitted and the mixture diluted, while by turning the screw right handedly the admission of fuel is increased and the mixture enriched.

At the right of the carbureter, on top, there is another screw with a hexagonal head and a lock nut. The latter serves as a stop for the throttle valve. By turning this screw to the left the throttle valve may be closed farther, and the quantity of air drawn in may be reduced to a greater extent, so that the idling speed of the engine is diminished. The opposite results are obtained if the screw is turned right handedly. Each time the gas feed for idling is thus varied, it is necessary also to regulate the mixture, as explained in the foregoing.

The lower portion of the carbureter is covered with an aluminum housing, which forms an air inlet trumpet. If for any reason



Two views of the carbureter used on the second series of Fiat engines

the gasoline level should become abnormal, the excess fuel is drained off through the housing in such a manner that all fire hazard due to a backfire through the carbureter is eliminated.

For the second series of engines certain modifications were made in the carbureter construction. These later carbureters are quadruple devices and have a single throttle valve with four openings. The throttle is placed horizontally in an aluminum body, through which passes the hot water from the engine jackets. Each of the two float chambers supplies two carbureters, and each carbureter is connected to a group of three cylinders. Each of the carbureters has a main spray nozzle for operation at high speed, and a secondary nozzle for idling; the latter may be adjusted by means of a diffuser, which is kept in position by a locknut. Turning the diffuser to the right enriches the mixture and vice versa.

At the side of the chamber containing the last small nozzle, at the right, there is a screw with locknut which forms a stop for the throttle valve, that is to say, which serves to regulate the amount of charge drawn in, and consequently the idling speed.

The diffuser of each main spray nozzle is fitted with a conical obturator; by lowering this obturator by means of an internal lever actuated by a flexible transmission, the carbureter throat is enlarged and the mixture is made leaner. This device therefore constitutes an altitude adjustment and should be operated whenever the airplane attains an altitude greater than 2,000 meters.

The pressure necessary for feeding fuel to the carbureter is at first produced by a hand pump placed on the control board, and in regular operation the pressure is maintained by a small pump located at the rear end of the camshaft, and operated by same. This pump is fitted with an adjustable check valve C. The other valve S serves to relieve any possible excess pressure produced in the tank by means of the hand pump.

IGNITION

Ignition is effected by two high-tension magnetos, each one being connected to its particular set of spark plugs, and fitted with an arrangement for advancing the spark. Spark control is by a small transverse shaft, fitted with a lever and sector, and connected by a rod to the carbureter control lever, in such a way that the complete opening of the control lever corresponds to the maximum spark advance.

Both magnetos rotate at one and a half times the speed of the crankshaft, this being necessary because they have to produce six firings during two revolutions of the engine. Consequently the effective variation in spark timing is only 2/3 the angular displacement of the lever, which varies the moment of ignition. For instance, the maximum advance with the magneto on the admission side being 32 deg., the ignition will take place with an advance of approximately 12 deg. if the lever is placed in the position of maximum lag, that is to say, by moving it through an angle of 30 deg. in the direction of rotation of the armature; with magnetos which are set for an advance of 40 deg., the advance is still about 6 deg. in the maximum retard position.

A switch permits of shutting off either one of the magnetos, for an ignition test, or both at a time for stopping the engine. (See diagram.)

In starting an engine, ignition is effected by current from a storage battery, which passes through the primary winding of the magneto on the inlet side, whenever the switch button is pressed down. In this manner, if there is still any combustible mixture in the cylinders, the engine may be started on the spark automatically. To start on the spark, the switch lever is placed in position 1-2 and the button is pressed. Current from the battery then flows to ground across the internal connection of the switch and into the primary winding of Magneto II, leaving same by the insulated part ending in the terminal in

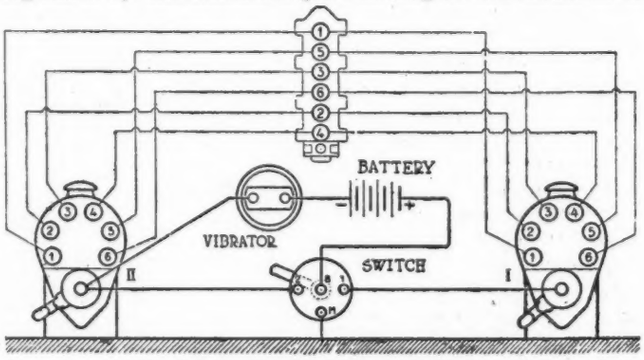
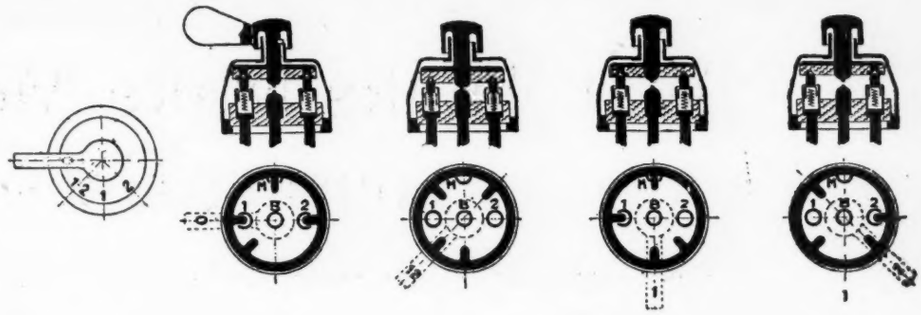


Diagram of ignition wiring

the cover of the interrupter, and finally passes through the interrupter.

In order to facilitate starting of the engine by means of the battery, the mechanical interrupter of the magneto at the inlet side has been fitted with a special cam, which increases the period of opening of the platinum contacts. This makes it unlikely that this interrupter should be in the closed position when the engine stops, in which case the battery current would return directly to ground, without passing through the primary winding.

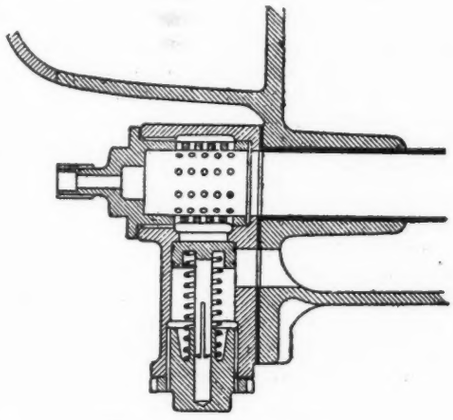


The four positions of the switch correspond to both magnetos off, both on and button depressed for starting No. 1 magneto on and No. 2 on

The firing order is 1-5-3-6-2-4, viewing the engine from the propeller end, but if one looks at the numbers on the crankcase below the cylinders, ignition takes place in the following order: 1-2-3-4-5-6. Consequently, the wires which lead to the spark plugs should be connected to the distributors of the magnetos according to that order, as indicated in the accompanying diagram.

LUBRICATION

Lubrication of the crankshaft and camshaft bearings is effected with oil under a pressure of 1 atmosphere, which is distributed by tubing contained in the crankcase. A gear pump draws oil from an outside tank. Two pumps secured below the crankcase serve to keep the latter dry, that is, to draw off any oil which accumulates at the bottom of the crankcase after having passed through the various bearings. These two pumps operate simultaneously if the motor is in a horizontal position, but if the motor is in an inclined position, the oil flows to one end of the crankcase, and only one pump is then operative, the other being above the oil level.



Oil pressure relief valve

The oil is delivered by the pump to a main located inside the crankcase, and thence it passes to an outside cooler, in which its temperature is lowered, which is essential to good operation. From there it is returned to the oil tank to be used over again.

The delivery of each of the two oil-return pumps is greater than that of the pump which feeds the oil, whereby an accumulation of oil in the engine is prevented.

Each pump is provided with a filter, which can be taken out after the pump has been dismounted. There is another filter in the oil tank, and this is combined with the tube which carries the oil to the feed pump. A pressure gage is located on the control board and is connected by a tube and coupling to the body of the pressure relief valve at the front of the crankcase.

The oil necessary for lubricating the valve mechanism is derived from an outlet located back of the pipe feeding the main bearings. Thence it rises through a vertical tube to the camshaft housing, and finally it passes through the camshaft, which it leaves through drill holes at the cams. The oil is returned from the cam housing through two tubes, which connect this housing with the crankcase, both on the carbureter side.

Non-Shatterable Glass

ONE of the industrial developments of the war was the manufacture of non-shatterable glass.

Automobiles were very largely used in the war to transport officers from place to place, frequently under fire. Rifle balls, shrapnel bullets and pieces of shell would strike windshields and, while the missile itself might not strike the occupants of a car, they would be struck and more or less seriously injured by flying pieces of glass.

Windshields were also often broken in collisions or by striking obstructions in the dark, for the machines had to be driven without lights both at the front and for many miles behind it.

Non-shatterable glass is made of two thicknesses of glass between which is inserted a piece of transparent sheeting material—in fact, the same or very similar to that used for windows in all types of open cars.

In making the glass, the hydraulic press is used. The two thicknesses of glass and the sheet of py-ra-lin are inserted between two heated plates. Transparent cement is first applied to hold the three parts firmly together. This process makes the product into a solid unit mass. In the process, the glass loses practically none of its natural strength or transparency.

Since the war, taxicab companies have been the first to see the desirability of using non-shatterable glass windshields. This is because many taxicab drivers are more or less irresponsible and reckless and taxicab companies are responsible for injuries to passengers while in their cars.

Non-shatterable glass windshields and windows will doubtless be adopted sooner or later for private passenger cars, as they tend toward increased safety. The glass is as transparent as ordinary plate glass, is claimed to be 50 per cent stronger and because of its excellent heat insulating qualities does not accumulate a coating of frost except at very low temperatures.

War Tanks Make Mountain Touring Cars

French competition for tractor-tanks develops the possibilities of serving isolated Alpine regions heretofore almost inaccessible. Mr. Bradley gives in these pages the story of a peace-time occupation for war tanks in the picturesque mountains of our Ally, showing the capabilities of these sturdy machines.

By W. F. Bradley

THE automotive industry must add to its products the Alpine tank—a vehicle that is a combination of the war time tank and agricultural tractor designed for use in mountainous countries. The suggestion was made a year ago to the Automobile Club of France that some special machine should be developed capable of reaching habitations in the French Alps at present only served by pack mules. The Alpine tank was designed to answer that suggestion.

France has thousands of farms located at an altitude of from 3,000 to 7,000 ft. above sea level that have near them no railways, roads or electric track cars. Supplies are carted to them laboriously by pack mules and the peasants, in sending down their produce to market, must do so either by the same way or by using an overhead cable swung from a mountain peak to a suitable spot in the valley.

As the tank had shown its value in the war, manufacturers of such machines were asked to adapt them for Alpine work. The result was the recent Alpine tank competition held on Mont d'Arbois, near Mont Blanc. Engineer Lumet, of the Technical Commission of the Automobile Club of France, mapped out a track that started at 3,600 ft. above sea level and finished at 6,000 ft., after covering a distance of 16,400 ft. This gave an average gradient of rather more than 14½ per cent, with many sections, however, as high as 75 and 80 per cent. Some slopes, which were tackled on the down gradient only, were as high as 100 per cent (45 deg.). At the outset the track was nothing more than a mule track about 80 inches wide. Later this pathway disappeared, only grass land remaining, which deteriorated in quantity as altitude was attained.

Renault, Peugeot and Latil sent machines. The Latil—a four wheel drive tractor used during the war for the haulage of heavy artillery—immediately discovered that it could not climb by reason of the narrowness of the track. There were certain passages with a vertical wall on one side and a clear drop on the other, only accessible to narrow-track machines. Further, it was obvious from the outset that, for this particular class of work, no wheeled machine could compete with the self-track laying machine.

Renault's machine was his standard agricultural tractor with two fore and aft seats placed immediately above the revolving bands. This machine is a development of the light two-man tank designed by Renault and built by various firms in great quantities. The same engine, clutches, reducing gears and final drive were employed. As there was no armor plating and weight had been considerably reduced, the width of the bands were diminished. The engine was put up in front and the driver placed at the extreme rear in order to give him a full view of and control over the plow.

Used as an Alpine tank, this machine was generally satisfactory. It climbed the hill in 1 hr. 35 min., and came down in 55 to 65 min. The engine, which is thermo-syphon cooled, did not overheat on the most difficult gradients. Although the lowest of the four gears had to be used on several occasions, there was no doubt about the ability of the machine to scale the mountain. The main disadvantage of the machine was the position of the driver at the rear.

Peugeot presented an agricultural tractor of the creeping band type. This carried the standard Peugeot 3-ton truck engine—with four cylinders of 100 by 150 mm. bore and stroke, the engine being in front and drive going through clutch—three speed gearbox, and differential to the main sprockets driving the bands. For turning purposes, one of the bands was locked and the drive taken through the differential to the opposite band. While this is satisfactory for agricultural work, the Renault system of two lateral clutches is preferable for Alpine tank service.

The design of the Peugeot agricultural tractor gives a big platform back of the engine on which the driver has his seat, and where additional seats were placed for passengers. Like most agricultural tractors, this machine has very inefficient brakes, as a consequence of which it was at a disadvantage when coming down hill. The cooling system, too, while evidently satisfactory for agricultural work, was rather inefficient for Alpine climbing. Notwithstanding this, the Peugeot climbed the hill in the fastest time and showed the lowest gasoline consumption.

The following is the net result of the competition:

	Ascent	Gas Consumption Going Up	Descent	Gas Consumption Coming Down
Renault I	1h. 35 min.	5.8 gal.	55 min.	1.7 gal.
Renault II	1h. 35 min.	6.8 gal.	1h. 5 min.	2.9 gal.
Renault I	1h. 35 min.	4.5 gal.	59 min.	2.3 gal.
Renault II	1h. 40 min.	3.5 gal.	1h. 23 min.	1.8 gal.
Peugeot	1h. 39 min.	3.5 gal.	1h. 32 min.	.....
Renault I	1h. 40 min.	.....	.....	.....
Peugeot	1h. 17 min.	4.7 gal.	1h. 21 min.	2.6 gal.

One of the Renault tanks took in tow an ordinary two-wheel trailer and carried a load of 600 lbs. of cement to a hotel under construction half way up the mountain. Normally this material would be taken up by mules hauling about 300 lbs. on a light two-wheel cart. The tank hauled double the load at twice the speed, in addition to ten passengers.

Scaling the Alpine Heights

Picturesque resting spot of the Peugeot, shown above and to the left, at an altitude of 10,000 ft.

The Renault negotiating a stiff grade. W. F. Bradley, the author, is seated between General Sirabley and Major Hyler of the British army

The Peugeot, above, passes an Alpine farm, while the Renault to the right overcomes a difficult bit of going

The FORUM

Proposed Horsepower Rating

Editor Automotive Industries:

THE horsepower rating of automobile engines is still based on the N.A.C.C. formula, which practically disregards the piston displacement, or in other words, the size of the engine. The horsepower tax is usually determined by the use of the N.A.C.C. formula, which is

$$\frac{B^2 \times N}{2.5} = HP.$$

It is quite generally known that this formula is based on 1000 ft.-min. piston speed, but regardless of whether the formula is based on 1000, 2000 or 3000 ft.-min., it does not consider the size of the engine. In this respect the formula is decidedly faulty. I dare to say that it is even absurd.

The best example I can think of to illustrate this point is to compare a 3¾ x 4 engine with a 3¾ x 6¾. Each of these is rated at 22½ hp., although one has a piston displacement of 177 cu. in. and the other 298 cu. in. These engines would not develop the same power even if they were equally well designed. Nevertheless they are rated and taxed the same.

The only reason for this is that they are rated at 1000 ft. per minute piston speed. This speed is obtained at 1500 r.p.m. in the small engine and 890 r.p.m. in the large engine. But why rate one engine at 1500 r.p.m. and another at 890 r.p.m. merely to hold them to the same piston speed? This factor, piston speed, means nothing in itself as far as power is concerned. I can recall two engines that develop the same power per cubic inch at approximately 3000 r.p.m., but one has a piston speed 90 per cent greater than the other. This is not the only illustration that can be found in practice to prove that piston speed in itself means nothing as far as power is concerned.

What automotive engineer would like to be accused of saying that piston displacement has nothing to do with the power of an engine? Not one, of course; but the whole industry might as well say it as to continue using a horsepower formula that states practically the same thing.

To my mind the only reasonable basis for a horsepower rating is piston displacement. However, it is out of question to derive a formula that will tell us the maximum power of any engine, but it is possible, I believe, to choose a formula based upon piston displacement that will compare very closely with the actual power developed by the average engine at some moderate speed in r.p.m.

After examining a number of horsepower curves, I have concluded that $\frac{P.D.}{10} = HP.$ is a formula that indicates the actual power of the average engine at 1000 r.p.m. A few engines show as much as 20 per cent more power than is indicated by this rating, but this method is not nearly so inaccurate as the N.A.C.C. formula, which rates two engines the same when they differ in size by almost 100 per cent. One thousand r.p.m. of the engine corresponds to approximately 25 miles per hour in the average automobile. It is the speed that is used most. It might also be considered as the governed speed of the average truck engine. However, since automobile engines are not rated at maximum power and maximum speed, we can forget the r.p.m. entirely, as far as the rating is concerned.

The following Table I makes it possible to compare the $\frac{P.D.}{10}$ rating with the N.A.C.C. rating.

TABLE I

Bore and Stroke	N. A. C. C. Rating $\frac{B^2 \times N.}{2.5}$ = Hp.	Proposed Piston Displacement Rating $\frac{P.D.}{10}$ = Hp.
3x4¼	14.40	12.02
3x4½	14.40	12.72
3x5	14.40	14.14
3⅛x4	15.63	12.27
3⅛x4¼	15.63	13.04
3⅛x4½	15.63	13.81
3⅛x5⅛	15.63	15.72
3¼x4	16.90	13.27
3¼x4½	16.90	14.93
3¼x5	16.90	16.59
3¼x5½	16.90	18.25
3⅜x4	18.23	14.31
3⅜x5	18.23	17.89
3½x4	19.60	15.39
3½x4½	19.60	17.32
3½x4¾	19.60	18.28
3½x5	19.60	19.24
3⅝x4½	21.03	18.58
3¾x4	21.80	17.09
3¾x4	22.50	17.67
3¾x4½	22.50	19.88
3¾x5	22.50	22.09
3¾x5¼	22.50	23.19
3¾x5½	22.50	24.29
3¾x6¾	22.50	29.82
3⅞x4	24.03	18.87
3⅞x4½	24.03	21.23
3⅞x5	24.03	23.58
4x4	25.60	20.11
4x4⅞	25.60	24.50
4x5	25.60	25.13
4x5¼	25.60	26.40
4x5½	25.60	27.65
4x6	25.60	30.16
4⅛x5¼	27.23	28.06
4¼x5¼	28.90	29.78
4¼x5½	28.90	31.20
4⅜x6	30.63	36.08
4½x5	32.40	31.81
4½x5½	32.40	34.99
4½x6	32.40	38.17
4¾x6	36.10	42.53
5x6	40.00	47.12
5¼x5¾	44.10	49.78

Table II shows the slight difference between the $\frac{P.D.}{10}$ = Hp. rating and the actual brake horsepower of several engines.

TABLE II

$\frac{P.D.}{10}$ = HP.	Actual B.HP.	Speed in R.P.M.	Stroke, Inches
19.8	23.5	1000	5⅛
22.7	27.0	1000	5⅛
27.7	28.5	1000	5½
31.2	33.0	1000	5½
21.2	21.0	1000	4½
17.7	17.0	1000	4
19.8	21.5	1000	5⅛
24.3	25.0	1000	
29.3	30.0	1000	
31.2	31.0	1000	
38.17	39.0	1000	6
28.8	35.0	1000	5
17.7	20.0	1000	4¾
24.9	30.0	1000	5
28.4	30.0	1000	
39.0	39.0	1000	
60.8	68.0	1000	
15.4	17.0	1000	4
30.2	33.0	1000	6
34.0	37.0	1000	6
42.5	44.0	1000	6
47.12	48.0	1000	6
22.09	24.0	1000	5
25.13	27.0	1000	5

It will be noticed in Table II that the strokes vary from 4 in. to 6 in. This means that the engines with 6-in. strokes have 50 per cent higher piston speed than those with 4-in. strokes when running at 1000 r.p.m.

It will be noticed, also, that the actual horsepower at 1000 r.p.m. is closely proportional to the piston displacement.

The piston speed apparently and correctly has nothing to do with the actual horsepower.

The piston displacement rating can be written

$$HP. = \frac{\pi B^2 LN}{40} \text{ or } HP. = \frac{0.7854 B^2 LN}{10}$$

in which

B = Bore
L = Stroke.
N = Number of cylinders.

Ralph C. Chesnutt, Assistant Chief Engineer,
North American Motors Co.

Carbon and Its Causes

Editor Automotive Industries:

THE field service and "trouble" men sent out by tractor manufacturing establishments to investigate complaints, remedy troubles and adjust difficulties find that in nine cases out of ten the troubles are directly the fault of the owners, resulting from neglect or lack of knowledge of the proper care and operation of the tractors.

A large proportion of these troubles result from overheating of the motor, due to carbonized cylinders and pistons or the introduction of foreign matter into the cylinders.

Records of such troubles indicate that road dust, ferric oxide and oil constitute a large percentage of the foreign matter found in cylinders, and from these statistics the need of a dry air cleaner for the purifying of air going through the carbureter is apparent. The records of a tractor service man taken in California covering an entire season show the following averages:

Foreign matter gathers at three points in the motor in the following proportions:

38 per cent in combustion chamber.
54 per cent under the top piston ring.
14 per cent on under side of piston.

The proportion of the various kinds of foreign matter which gathers at these three points was shown to be as follows:

Character of Matter	In Combustion Chamber, Per Cent	Under Top Piston Ring, Per Cent	Under Side of Piston, Per Cent
Oils	16.60	9.95	12.04
Carbon	45.24	35.99	74.12
Ferric Oxide	14.29	36.24	6.80
Road Dust	23.87	17.82	7.04
	100.00	100.00	100.00

With the air intake properly protected by an air cleaner, thus eliminating so far as possible all road dust, it was found that there will still be five reasons for overheating of motors. In 60 per cent of the cases it was the fault of the engineer, because the trouble was due to an overrich mixture or to overpinning, while 40 per cent were due to other causes—viz., late magneto timing, impaired circulation and inferior lubricating oil. C. L. L.

Correction of British Import Duties

IN a table presenting the import duties of American automotive products, printed in Automotive Industries in the issue of Aug. 14, it was stated that the duty on trucks imported into the United Kingdom was 33.3 per cent, including freight and insurance for dutiable value, but deducting tire value.

This information was obtained from the Department of Commerce, Bureau of Foreign and Domestic Commerce, which asks us to state that this was an error and that motor trucks are allowed into the United Kingdom free of duty.

Weight of the Atlas Axle

THE weight of the Atlas axle, which was described in Automotive Industries of Sept. 11, was given as 975 lb., but should have been 875 lb. This is a typographical error, which we are glad to correct concerning this axle, which is a product of the American Machine Co.

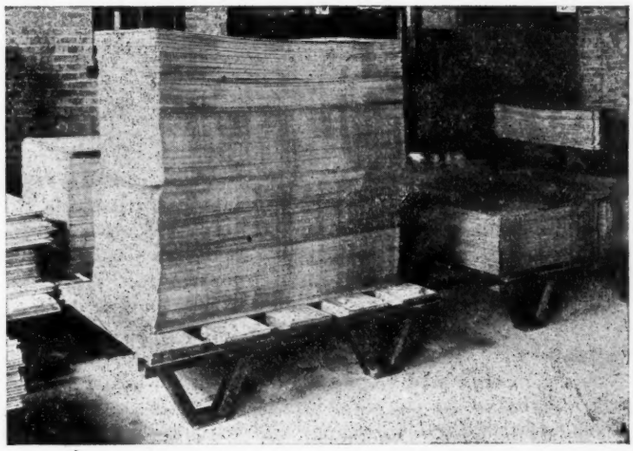
Steel Skid Legs

THOSE who have had experience with elevating truck platforms, especially in handling heavy loads, will have found that these have one of two faults—either they are very bulky and cumbersome or the legs are weak. Besides, the legs are apt to wear down, so that the skid does not set level, break off, or crack.

To obviate these troubles, a steel skid leg has been introduced. The accompanying photograph shows a platform built with these legs, carrying a load of seven tons. The skid leg consists of two welded feet which in turn are welded to a steel channel. This channel is provided with bolt holes which are spaced so as to make it convenient to bolt on either a wood or a steel top. It is claimed that the rounded corners and wide bearing surface save floors.

A valuable feature of the skid legs is that additional supplies of platforms may be carried in stock, knocked down, so that they take up very little space and yet are instantly available. The wood cross pieces can be drilled to fit the skid leg, which is punched to a standard pattern. All that is necessary to have a new platform complete for use is to get out the required number of cross pieces and bolt them to the skid legs. The platforms may be made any width.

These skid legs are made by the Lyon Metallic Mfg. Co.



How to Check the Radical in Labor Circles

The individual organization must be the unit in dealings with labor, according to Mr. Tipper, who points out in this article the futility of endeavoring to reach a satisfactory agreement through the undercurrent of politics that must thread through collective bargaining with the employees of 150 organizations. So it is up to each employer to put his workers in the attitude of resisting the lure of the radical.

By Harry Tipper

IN these articles we have called attention from time to time to the increasing division of opinion in the ranks of labor as between the radical element favoring what is termed in Europe direct action, and the conservative element favoring the older methods of arriving at an agreement.

It has been evident that, since the war, the radical elements have found themselves sufficiently powerful to voice their sentiments boldly and to capture the machinery of the organization in case after case where a strike was imminent. This indicated that the fight between the radical and conservative opinions would develop until a trial of strength became necessary, where the issues were clearly drawn.

In the strikes which have occurred, since the armistice up to the present time, the demands for increased wages and shorter hours and other rearrangements of working conditions have confused the issue so that the significance of the radical development has not been understood.

In September the American Federation of Labor felt itself strong enough in the steel industry to formulate some demands upon the steel companies and to request a conference with the head of the United States Steel Corporation and other large concerns, for the purpose of talking over these demands. The American Federation of Labor has attempted to organize the workers in the steel industry a number of times and has met with almost complete failure in these attempts, largely because the steel companies themselves have voluntarily increased the wages and improved the working conditions, so that the workers in the steel mills have been highly paid in comparison with other workers in other lines of industry.

It is evident that the growth of labor power during the war, the position of Federation leaders, their influence with the governmental departments and the general admittance of a new order of things, inspired the Federation leaders to attempt this organization of the steel industry once more. Undoubtedly the time was propitious. Labor organizations had received an amount of attention from the public which had never been conceded to them before. Labor demands had been considered in a way which has no parallel in previous history in this country and the four brotherhoods of the railway workers had succeeded in securing from the government largely increased wages and shorter hours without much trouble, on an exhibition of potential strength.

Unfortunately for the American Federation of Labor some of the leaders, who had been organizing the steel workers, had been carried away by the new power of labor and the alluring ideas of the radicals into the belief that they were in a position to force the hands of the strong companies in the steel industry. As a consequence, the refusal of Judge Gary to confer with the Federation leaders resulted in a strike.

It was apparent in the beginning that the call for strike was not justified either from the standpoint of the condition of labor in the steel industry or from the standpoint of wise politics on the part of the Federation. It was immediately apparent that the hot heads in the Federation had overestimated their strength and had imagined that a strike would strengthen the weakness of their organization in this line of industry.

The testimony of Fitzpatrick before the Senate Committee included the very significant statement that they struck because if they had attempted to wait for the President's conference they would have been all shot to pieces, indicating that the organization of unions which they had succeeded in gathering together among the steel workers would not hold unless the strike was called.

It is always hard to hold workers to a strike vote unless the action upon the vote is taken almost immediately. When they have voted to strike and the time drags along without any strike occurring, the enthusiasm for an escape from work dies down and it is difficult to hold the organization to its original position. This is true even in industries where the workers are strongly organized. This was evidently what Fitzpatrick feared and admitted in his statement before Congress.

It is apparent that the strike has not had the effect which the Federation leaders expected. While it has crippled plants in some sections of the country, it has failed to a very large extent in the Pittsburgh district, which is the center of the steel industry, and it has failed almost entirely in the plants of the Bethlehem Steel Company, probably the most important of the independent companies. The reports of the daily newspapers in some

sections, particularly the newspapers in New York and Chicago, concede an importance and a strength to this strike in the Monongahela Valley which is not conceded by private observers on either side.

Investigations made for the purpose of discvering the impression created upon competent observers on visits to Pittsburgh bring the report that the only evidences of a strike in that city are the extra policemen guarding the plants. The Pittsburgh papers have relegated the matter to the inside of the papers or to a very small portion of the front page. The plants appear to be active and at least a very considerable portion of the workers appear on the streets on their way to work at the regular time.

It is unfortunate that the American Federation of Labor should have allowed itself to be drawn into this situation by the unreliable reports of some of the radical leaders who have been very active in the organization of the steel workers. So far the American Federation has stood out against the radicals in general and has counseled patience and legal action in connection with the workers' demands at the present time.

This strike, the attitude of Federation leaders in the Boston affair and other disturbances indicate that the radical element is either sufficiently powerful or sufficiently vociferous to oblige the conservative leaders to trim their sails and recede somewhat from their well defined previous position.

In New York something of the same clash of labor opinion is seen in the strike of printers which may delay your receipt of this article. Here again there is a clash between the international union, which is the Federation union, and the local leaders, who have in two instances broken away, practically, from international rulings and who clash in their opinion as to the right methods to be employed in the present situation.

Here again the employer is caught in the jam between the opposing factions in the labor organization, finding it impossible to arrive at an agreement with either body because of the strength of the other faction and therefore unable to continue his business because of the disagreements in the labor ranks themselves.

These elements of the struggle simply emphasize the statement which has been made many times in these articles that no solution of this difficulty can be expected from the collective organizations of labor and capital. No agreement can be provided between bodies which are organized along political lines and which are therefore subject to the violent reactions of all politics and which cannot hold any reasonable unity for a considerable length of time.

Labor organizations leave a great amount of power in the hands of the leaders, but they check that power by the growth of oppositional parties within the labor ranks and the flux and change of leadership which occurs cancels all previous agreements and makes impossible any permanent peaceful settlements.

The railroad strike in England shows a severe condition from the same causes. The constitution of the unions of railway workers permits the executive body to call a strike without taking the strike vote. The executive body, having taken an extremely radical position with the government and having left themselves no line of retreat, have been obliged to call a strike, even though the conditions were such as to alienate public opinion, and even though many of the leaders in the union itself did not agree with the position which has been assumed.

Undoubtedly these tests will ultimately clarify the situation, but they will fail of their purpose to some extent if they do not emphasize to the employer the utter impossibility of collective bargaining between groups of labor not responsible for the conduct or the product of an organization, not interested in the personnel of their particular organization, and not concerned with anything but the political situation, power and strength of the body of which they happen to be representative.

There is no escape from the conclusion that no matter whether they provide a solution for the immediate difficulties or not, some measures must be taken by employers which will transfer the allegiance from the union to the employing organization, which will develop an interest and an incentive in connection with the organization instead of with the unions and which will bring unity into the individual concern and not attempt to secure that unity by a collective fight between all the workers and an industry and all the individual organizations concerned therein.

Labor leaders vary in their opinions just as the rank and file of labor vary in its demands. Manufacturers vary in their outlook and managers of industry are not alike in their ideas as to management. To attempt to eliminate all these conditions and arrive at collective agreements is to neglect the human side of the case, even where the very discussion is based upon the human side.

If the individual organization and the workers for that organization get together with a reasonable and unified responsibility in connection with it, the general situation will gradually clear itself with a much better possibility of remaining permanently cleared. The latest demand of the steel workers is the government's interference in connection with the matter. It is to be hoped that the administration will be wise enough to keep out of this matter. To attempt to find a basis of agreement between 500,000 workers and 150 companies is near enough an impossibility, without having governmental departments with their bureaucratic attitude on everything, confusing the issues still more in their attempts to temporize and satisfy both sides.

The injustices which the worker has suffered during the industrial development in the last seventy-five years are flagrant enough, but no past injustices of that kind and no present injustices can make the extreme demands of labor reasonable or provide means by which industry can meet them and still continue to run with reasonable diligency.

There comes a time when the decision must be deferred until the fight is over and the present attitude of labor indicates that it will be impossible to continue discussions with some of the leaders until they have been beaten; because of their irreconcilable attitude which is frankly a demand for control, and not for improved economic conditions.

The danger in the situation lies in the fact that outside of the United States only a small portion of the world is producing enough of the necessities of life to maintain the population which they must maintain. Any considerable cessation of activity in industry in these countries will result in the starvation of a proportionate number of the population. It is probable that more people will starve in Russia this winter than were killed in the war, and it is not improbable that economic conditions will be severer in other European countries.

A thorough study of the point of view of labor, a thorough attempt to understand its necessities, a sympathy with the more intelligent and conservative workers in the ranks and the getting together in the individual organizations for the purpose of working out its difficulties, are necessary if the radical is to be shorn of what power he has and if industry is to meet its new development with the increased human efficiency that is necessary to take care of its requirements.

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Even Canada

WHILE our lawmakers are talking party politics, Canada is going ahead with the organization of a Department of Aeronautics. The draft of this department, which is printed in this issue, is well worth your consideration. Perhaps the most interesting part of this outline is the section which sets out the duties of the proposed Air Board. One paragraph is especially suggestive. We quote this paragraph:

"To study the development of aeronautics in Canada, and in other countries, and to undertake such technical research as may be requisite for the development of aeronautics, and to co-operate with other institutions in the carrying out of such research."

Again in the "Powers" of the Board is found this section:

"To establish the conditions under which goods, mails and passengers may be imported into Canada or from Canada, or within the limits of the territorial waters of Canada, or may be transported over any part of such territory."

These paragraphs are quoted for two reasons:

First to show that the leaders in Canada are not in doubt that there is a future to aviation and also that they believe that the government must be the leader in the new field. The proposed Air Board is, through research, to be the pilot of this industry into a useful place in the general scheme of things.

Second, to show that Canada expects international complications and that the Government proposes to have a grasp on these affairs from the start. When Canada is greeting the American flyers by a set code and disposing of the international questions in a satisfactory matter, how will this country be treating Canadian flyers who cross into this country?

Apparently Canada is going to "show us up."

Why Not Be Honest?

PERSONS who have most to do with export business disputes are much disturbed over complaints reaching them that American manufacturers are not treating their new customers fairly. The Americans, it appears, are taking advantage of the ignorance of the foreigner of the conditions in the port of New York. The facts are these:

Many quotations have been made to firms that have never before bought goods through the port of New York. These quotations have been "F.O.B. New York." In Australia, especially, this means "free on board overseas vessel." In New York it means many other things. It means that the purchaser must pay all of the charges that are accumulated between the freight car in Hoboken and the vessel at Staten Island. As a result the customer feels that he has been imposed upon. Perhaps he has.

Be this as it may. There is only one way to build an export business. That is by selling according to rules and quotations that are both morally and technically honest.

Effect of Carbon Dioxide on the Explosion of Gas Mixtures

AN investigation of the effect of the admixture of carbon dioxide with a combustible charge of hydrocarbon gases has recently been made in England, and the results obtained should be of interest to students of the explosion engine. The really active constituents of the explosive charge are the hydrocarbon gas and the oxygen. The nitrogen of the air, which is present in about three and a half times the amount of the oxygen, acts merely as a diluent, retarding the rate of combustion and keeping down the maximum temperature and pressure reached.

As the maximum temperature and pressure reached during combustion depend upon the specific heats of all the components of the charge, it would be expected that if another gas having a different specific heat were substituted for nitrogen, the explosion characteristics would be different. This was confirmed by the experiments. It was found that when carbon dioxide is substituted in an explosive mixture for an equal amount of nitrogen, far lower pressures are produced and the rate of combustion is slowed down. It is believed that an admixture of carbon dioxide in the proportion used in the experiments (a maximum of 65.3 per cent of the whole charge) slows down the combustion to such an

extent that some of the charge remains unburnt at the moment of maximum pressure. This, together with the high volumetric heat of carbon dioxide at high temperatures, appears to be mainly responsible for the lower pressures produced.

All of the tests were made in a closed vessel of constant volume, and the results cannot, therefore, be directly applied to engine cylinders, at least not quantitatively. However, the difference between the explosion temperatures attained with a pure mixture of coal gas and air and that with a mixture in which 90 per cent of the nitrogen was replaced by carbon dioxide is so great that the retarding effect on the combustion in an engine cylinder cannot be doubted. For instance, with a 15 per cent gas mixture the maximum temperature was about 40 per cent greater in the first case and was attained in one third the time.

These results seem to indicate that considerable advantage might be gained by scavenging. But an investigation shows that there is only a moderate percentage of carbon dioxide in the exhaust gases. For instance, assuming a theoretically correctly proportioned combustible mixture, the exhaust gases are made up of 18.7 per cent of carbon dioxide, 72 per cent of nitrogen and 9.3 per cent of steam. Now, when running under full load, only about 25 per cent dead gas remains in the combustion chamber and the percentage of carbon dioxide in the new charge is then less than 5 per cent. At partial loads the proportion would be somewhat higher but still relatively insignificant and no appreciable gain could be expected from eliminating this. Naturally a scavenging engine taking from 25 to 30 per cent more charge during every inlet stroke will develop more power in proportion, but there would be little gain beyond this.

Over-running

IN order that a pair of clash gears may be meshed smoothly it is necessary that the ends of the teeth be properly chamfered and that the pitch line velocities of pinion and gear to be meshed, be substantially alike. If another set of gears has been unmeshed only an instant previously, these velocities cannot be alike. For instance, while the intermediate set of gears are in mesh and the car is running, the pitch line velocity of the low speed pinion is only little more than one half as great as that of the low speed gear. If an attempt is made to mesh them regardless of peripheral speeds, severe clashing will result, and the gears are likely to be injured. The damage done will be the greater the greater the moment of inertia of the clutch driven member, as it is this part which offers the greatest resistance to a quick change in speed of the lay shaft and its connected parts.

If the change to be made is from a lower to a higher gear the lay shaft will be running too fast for easy meshing, but this can be corrected by the clutch brake generally provided on cars, especially on those having clutches with a considerable moment of inertia. But for a change from a higher to a lower gear the clutch brake is of no service. When ascending a hill the car, of course, will quickly lose speed, and this will bring the pitch line velocity of the driven member of the pair to be meshed down to that of the driving member. But sometimes a change to a lower gear has to be made on the level where the car coasts along freely. Another consideration is that few drivers can tell with any degree of certainty when the car is running at the proper speed to make changing to a lower gear easy.

It is to make gear changing under these conditions easy that some makers have been and are using over-running clutches on the lay shaft. With such a clutch, if the driven member of a pair at the moment of meshing runs at a higher pitch line velocity than the driving member, the latter will simply run ahead of the lay shaft, or the lay shaft will run ahead of the constant mesh gear, according to the location of the over-running clutch.

The objection to these over-running clutches is that they will not permit of using the engine as a brake on those gears for which they are effective. If the over-running clutch is located in the constant mesh gear at the forward end of the transmission, the engine cannot be used as a brake at all; but if the over-running clutch is in any of the other gears on the lay shaft only the gears which it frees will be unavailable for use in braking with the engine.

Have You Seen Him?

ONCE upon a time, say before the war, a large number of communications reached the editorial office of Automotive Industries from the younger engineers, who, having convinced themselves that they had an idea, were anxious to get this idea before the large body of men interested in designing and building improved automotive vehicles. The idea, apparently, was to get criticism of other and perhaps older men in the industry.

But when these men went into national service to help in winning the war, the silence rule stopped their typewriters. Everything then was done under cover, for fear that the Germans would learn of it.

But the war was ended a year ago. Some of these engineers and designers were permitted to return to their own work at once and others have "got home" only recently. But with some of them, for months out of the blanked silence, it would appear that there had been time for them to develop new ideas that are worthy of consideration. We notice that the engineering societies are still suffering a lack of the novelty that formerly marked their meetings, and several of the current meeting programs go back to war ideas for their subjects.

Have you seen the young engineer who once had the typewriter habit? If you have, what is the change? Is he converted to the policy of mystery? Is the influence of the Government silence on him permanently?

If this influence is permanent, it is to be regretted. The young engineer's publicity efforts formerly were the basis of much helpful and entertaining discussion. Automotive Industries would like to see some of these products again. They might serve to help some young engineers—and older ones, too—over the high cost of living hurdle. At least the editorial force would willingly read some of them again.

DRAWINGS HELD FOR THE NATIONAL SHOWS

Many Makers Will Be Seen in Their Old Places—Truck Show Going Well

NEW YORK, Oct. 3—As in days gone by, the manufacturers of cars and trucks gathered yesterday in the rooms of the National Automobile Chamber of Commerce and drew for space for the New York and Chicago shows, to be held respectively Jan. 3-10 and 24-31. Last year the N. A. C. C. did not hold the shows, so they were held by the dealers in both cities.

For the drawing, the order of choice had been determined upon a basis of production, each maker selecting any one of the three years 1917, 1918 and 1919. Manager Samuel A. Miles posted big charts of floors at one end of the room, distributed drawing lists and miniature floor plans, and as each maker's name was called he chose his space. His name was then marked on the big charts. The passenger car drawings were simple, because the old show buildings were used, but, inasmuch as the truck shows are being held in buildings never used before, the spaces were laid out unusually large and there had to be considerable explaining and cutting and fitting before the drawings were made.

The New York passenger car show will be held in Grand Central Palace in the usual manner. The New York truck show will be held in the Eighth Coast Artillery Armory, in the Bronx, which was chosen because of its enormous floor space, 300x600 ft. The Chicago car show, as usual, will be in the Coliseum and the First Regiment Armory, while the truck show will be in the International Amphitheatre, some distance from the loop. The amphitheatre also was chosen because of its large space. Conventions, transportation meetings and other features will be combined with the truck shows. Both car and truck shows, in each city, will run at the same time.

In the following lists of exhibitors the abbreviation C means that a company will exhibit in Chicago only; N, in New York only, and 2, in both Chicago and New York.

The Car Shows

Buick, 2; Willys-Overland, 2; Dodge Brothers, 2; Chevrolet, 2; Studebaker, 2; Maxwell, 2; Cadillac, 2; Hudson, 2; Oakland, 2; Oldsmobile, 2; Packard, 2; Reo, 2; Chandler, 2; Franklin, 2; Saxon, 2; Paige-Detroit, 2.

Pierce-Arrow, 2; Chalmers, 2; Mitchell, 2; Hupmobile, 2; Dort, 2; Haynes, 2; Marmon, 2; Cole, 2; Scripps-Booth, 2; Velie, 2; Briscoe, 2; Winton, 2; Grant, 2; Stutz, 2; National, 2; Kissel, 2; Lexington, 2; Peerless, 2.

Liberty, 2; Stearns, 2; Elgin, 2; Allen, 2; Anderson, 2; Auburn, 2; Premier, 2; Jordan, 2; King, 2; Moon, 2; Columbia, 2; Elcar, 2; Case, 2; Stephens, 2; Crow-Elkhart, 2; Apperson, 2; Mercer, 2; Westcott, 2; Roamer, 2.

Jackson, 2; Standard, 2; F. I. A. T., 2; Paterson, 2; Moline-Knight, 2; Milburn, 2; Davis, 2; Pilot, C; Hollier, 2; McFarlan, 2; Anderson, 2; Kline, N.; Dorris, 2; Holmes, 2; Templar, 2; Cleveland, 2; Monroe, C.

Owen, 2; Stevens-Duryea, 2; Monitor, 2; Olympian, 2; Dixie, 2; Maibohm, 2; Doble, 2; Stanley, 2; Commonwealth, 2; Comet, 2; American Beauty, 2; American, 2; Biddle, 2; Sayers, 2; Essex, N; Leach, C.

The Truck Shows

Pierce-Arrow, 2; Packard, 2; Nash, 2; Dodge Brothers, 2; I. H. C., 2; Federal, 2; Garford, 2; Kelly-Springfield, N; Reo, 2; Maxwell, 2; Bethlehem, 2; Autocar, 2; Paige-Detroit, 2 ;Velie, N; Denby, 2.

Stewart, 2; Oldsmobile, 2; Service, C; Diamond T, 2; Commerce, 2; Vim, 2; Selden, 2; Acme, 2; Clyde, 2; Kissel, 2; Willys-Overland, 2; Brockway, N; Atterbury, —; Maccar, 2; Schacht, 2; Sanford, N; Dorris, 2.

Ward, N; Corbitt, N; Oneida, 2; Wilson, N; Walter, 2; Jackson, 2; Walker, 2; Master, 2; Rainier, N; Gramm-Bernstein, C; Armleder, C; Koehler, N; Kalamazoo, C; Defiance, 2; Gary, C; Fulton, 2; Nelson, N; Union, 2; Oberchain, C; Indiana, 2; Dependable, C; Acason, 2; Allen, C; American M. T. Co., 2; Commercial, N.

New Mercer Motors Co. Plans Large Output

NEW YORK, Oct. 8—The Mercer Motors Co., recently organized under Delaware laws, will acquire all the properties, business, assets, etc., of the Mercer Automobile Co., of New Jersey. Substantially the entire capital stock of the latter corporation is to be absorbed, and arrangements have been made through Colgate, Parker & Co., to underwrite 89,000 shares of Mercer Motors Company of Delaware stock, a public offering which will be made shortly. Elmen S. Hare, former vice president of the Packard Motor Car Co., will be president. The company's plant at Trenton, N. J., on the Pennsylvania railroad, comprises a plot of 12 acres with a modern factory having a floor space of 137,000 sq. ft.

Production of 250 cars a month in some months is estimated. The net earnings before taxes, for three months ending Aug. 31, 1919, averaged more than $42,000 a month. With the contemplated increase in production, earnings of $800,000 for 1920 and $1,500,000 for 1921 are predicted.

100,000 Oakland Cars Are Planned for 1920

PONTIAC, MICH., Oct. 8—The Oakland Motor Car Co. proposes to build 100,000 automobiles in 1920. Plant extensions costing $2,000,000 are to be made at once. These do not include the $250,000 administration building now being erected.

G. M. C. May Control Fisher Body Corp.

DETROIT, Oct. 8—A proposal of the General Motors Corp. for the purchase of 300,000 shares of common stock, representing an increase of the present capitalization of the Fisher Body Corp. to $500,000, is being considered favorably by the directors of the latter corporation, according to President F. J. Fisher. The plan contemplates a voting trust which will insure continuation of control of the Fisher Body Corp. by the present management. The transaction is expected to provide the capital necessary to meet the enormous demand for Fisher products. Action is expected at a meeting of the directors of the Fisher corporation in the next few weeks authorizing the conclusion of negotiations. Plans are under way, however, to increase greatly the capacity of the Fisher plant.

SPICER COMPANY IN BIG PARTS MERGER

Sheldon Axle and Parish Join in Combine—Plan Additions

NEW YORK, Oct. 9—The merger of three large parts companies has been announced in financial quarters here. The combine is headed by the Spicer Mfg. Co., of South Plainfield, N. J., makers of universal joints and shafts, and includes the Sheldon Axle & Spring Co., of Wilkes-Barre, Pa., and the Parish Mfg. Co. of Reading, Pa., makers of axles and frames.

Rumors link up the names of several other companies as being concerned in the deal but the advertisements of bankers, offering an issue of $3,000,000 of six percent serial gold notes for the Spicer company, speaks only of the three concerns mentioned. The Spicer company also has announced that negotiations are under way for the purchase of a large plant, with facilities covering sixteen acres, at Pottstown, Pa., where it is expected that 25,000 joints will be produced monthly.

Additions are contemplated to the Parish and Sheldon plants, although it was said that the management and policies of each would remain unchanged. The Spicer company has purchased 85 percent of the Sheldon stock while the entire stock of the Parish company has been absorbed, it was announced. Net earnings, before Federal taxes, for the three companies during the fiscal year 1918-19 were given as $3,286,545. The Spicer issue has been underwritten by Merrill, Lynch & Co., of New York, and Cassatt & Co., of Philadelphia.

TO BUILD ELECTRIC TRUCK

GREEN BAY, WIS., Oct. 4—The Oneida Motor Truck Co. has announced the addition of a new electric truck to their line of haulage units. Up to the present the Oneida line has included five models of the gasoline motor truck, ranging from 1¼ to 5 tons capacity.

PEERLESS CORP. DIVIDEND

CLEVELAND, Oct. 8—The Peerless Truck & Motor Corp. has declared an initial dividend of 1½ per cent and an extra ½ per cent payable out of surplus profits of the corporation. The directors have decided that in so far as the earnings of the company will permit the policy of paying regular quarterly dividends of 1½ per cent will be established and such extra dividend from time to time as conditions of the business will permit.

ROLLS-ROYCES ARRIVE

NEW YORK, Oct. 4—The first Rolls-Royce cars to reach America since the armistice have arrived at the show rooms of Robert W. Schuette, Fifth Avenue. A self-cranking apparatus is the feature among several additional appliances.

LARGE MOTOR PARTS CENTER FOR DETROIT

World's Greatest Exchange to Have Home in Ford Service Building

DETROIT, Oct. 8—With the completion of negotiations for a 15-year lease on the eight-story service building of the Ford Motor Co. between the Stormfeltz-Loveley Co., owners, and Charles F. Van Sicklen, the work of remodeling the interior of the building to house the largest automobile parts exchange in the country has been started. Announcement was made yesterday that the building probably would be ready for occupancy by Dec. 1.

The structure fronts 97.5 ft. on Woodward Avenue and 320 ft. on Grand Boulevard, the center of the automobile industry in Detroit, and contains 300,000 sq. ft. of floor space. The site on which it is located is 117x360 ft. It is one block east of the proposed fifteen-story building of the General Motors Corp. The lease is said to involve a rental approximating $4,000,000.

According to the plans, an interior wall will be constructed around the four sides of the building on seven floors and divided into offices. The space in the center of each floor will be divided into sections for the display of the particular product handled by the firm occupying the office that faces the particular exhibit section. The first floor will be devoted to automobile salesrooms, and if permission can be obtained immense showcases will be erected along the boulevard on Woodward Avenue between the building and the sidewalk for the display of the cars, leaving the entire first floor for salesroom offices. There will be no repair or service department, the plans contemplating an exhibit and sales building distinctively.

Van Sicklen, who is widely known in the industry, will organize a stock company, preferably a co-operative organization, with the tenants holding the stock in the company. It is planned to make the exchange the headquarters for the motor parts industry of the world.

Such an institution long has been sought by steel companies and other manufacturers with the idea of furnishing an opportunity for purchasing agents to find every detail in automobile equipment at hand, with complete exhibits of each product from the raw material to the finished part. While the first floor will be devoted to car sales, the other seven will be given over entirely to the manufacturers for wholesale business.

Three large freight elevators are in the building, and passenger elevators will be installed. The boulevard and Woodward Avenue sides of the first floor will be of glass. Private telephone and telegraph stations will be included in the building. Special mail delivery service also will be sought. An attractive feature will be the electric advertising signs on the roof, which will be visible for many miles up and down the boulevard and the avenue.

The Stormfeltz-Lovely Co., acting as building manager, already has booked many of the firms already represented locally. Several outside industries have signified their intention to open offices and salesrooms in the new exchange.

Paper Wrapping Barred On Heavy Packages

NEW YORK, Oct. 6—Paper wrappings will not be permitted on express packages weighing more than twenty-five pounds after Dec. 9. The new rules, effective Dec. 10, are being put into effect by the American Railway Express Co. to induce shippers to turn their business over to the carrier so that it can, with reasonable care on the part of the company, be handled properly.

When packages are over the weight limit, wooden containers or fibreboard, pulpboard or corrugated strawboard containers of specified test strengths are required. The new regulations are embodied in Supplement No. 5 to Express Classification No. 26, copies of which may be secured at any express office.

SUPPLYING FARM STATISTICS

WASHINGTON, Oct. 7—Tractor manufacturers will be interested in the report of the Census Bureau preparatory to gathering farm statistics. The Bureau undertakes to secure complete data regarding the acreage value and crops, and in addition will gather information showing the exact number of farms in this country. It is expected that an increase of 1,000,000 farms will be shown since 1910, when 6,361,562 farms were counted, at a value of more than $40,000,000.

BECOMES CANADIAN AGENT

The Roller-Smith Co., 233 Broadway, New York, announces the appointment of the Alfred Collyer Co., 430 Power Building, 83 Craig Street, West, Montreal, Canada, as its agent in the entire Dominion of Canada and Newfoundland.

The Alfred Collyer Co. will handle the Roller-Smith Co.'s products of instruments and circuit brokers. The Alfred Collyer Co., which also represents the Wagner Electric Manufacturing Co., has a branch office at 183 George Street, Toronto.

TRACTOR CONFERENCE HELD

CHICAGO, Oct. 6—For the purpose of determining the economic basis of farm power and to be in a position where it can recommend to the individual farmer whether it will be more economical for him to use a tractor or horses on his farm, a conference was held here recently, called by Secretary of Agriculture Houston. The department was represented by Assistant Secretary McCormick, and G. I. Christie, the latter acting as chairman. Tractor manufacturers, research engineers, college professors and horse breeders, to the number of about fifty, attended the conference.

SEVERAL CHANGES IN THE 1920 HUPMOBILE

Mechanical Refinements and Improved Body Feature New Model

DETROIT, Oct. 6—An improved body and a few mechanical changes have been made in the series R-3 Hupmobile now in production. By increasing the height of the radiator, the car is given a higher appearance, in accordance with the straight line characteristics of present-day bodies.

The mechanical refinements consist in enlarging the dimensions of the steering gear parts for greater strength, a heavier front axle with Gurney ball bearings and the adoption of the Alemite grease cups throughout in which a pressure gun is used to charge the grease cups under heavy pressure.

There have been some refinements also in the more substantial construction of the body, cowl and windshield, as well as the headlight support and brackets. Outside focusing is now provided on the headlight bulbs and the brackets are so arranged that quick adjustment sideways or up and down can be made. The front seat cushion has been increased 1 in. in depth and the back of the front seat 2 in. in height.

Handley-Page Gets Canadian Charter

MORRISBURG, ONT., Oct. 4—Handley-Page, Ltd., have secured a Dominion charter to engage in a general aeroplane business in Canada. The capital stock will be $2,500,000. The head offices will be at Morrisburg, Ont. The directors are William Harold and Admiral Mark Kerr, London, England; Harry Clark, Montreal; Fred Chalmers and W. H. Gannon, Morrisburg.

NEVILLE SALES MANAGER

DETROIT, Oct. 7—Announcement of the appointment of Charles A. Neville as sales manager of the Hinkley Motors Corp. was made yesterday by President C. C. Hinkley.

Neville joined the Hinkley staff soon after the organization of the company and by diligent efforts in the sales department he climbed rapidly. His result-getting methods attracted the attention of the officers of the company and earned him quick promotion to the head of the department.

1919 "INFORMATION" OUT

UNION CITY, IND., Oct. 7—The 1919 edition of "Information," issued by H. E. Phillips & Co., manufacturers of garage testing instruments, is announced.

TO SELL CARS IN INDIA

NEW YORK, Oct. 8—The A. F. Motor Works, Hughes Road, Chowpatty, Bombay, India, has announced its intention of importing American passenger cars.

DETROIT FREIGHT SERVICE IMPROVED

No Complaint of "Hogging" Since Rail Administration Assigned Director

DETROIT, Oct. 8—Uninterrupted traffic from Detroit and Michigan motor factories within the last month, taking care of all demands to the entire satisfaction of everyone, has emphasized the wisdom of the action of the United States Railroad Administration in assigning an automotive traffic director to Detroit. Every manufacturer in the district has been given an even break in the matter of railroad equipment. The fact that there is no longer complaint of "hogging," in the language of one manufacturer, is the best evidence that the scheme has proved highly successful.

Three months ago insistent demands of certain manufacturers for equipment for handling their output and frequent complaints that certain members of the trade were being favored, resulted in the establishment of a traffic office here with C. H. Ketcham in charge and acting under the direct supervision of Regional Director A. F. Hardin, of New York.

Ketcham, whose career has taken him over practically all of the United States, served on the staff of Director Hardin during the war, and came to Detroit thoroughly familiar with the situation as it existed here. His first duty was to familiarize himself with the conditions at the various plants in the Michigan territory, particularly as regarded the needs of the automobile business. The next step was to so systematize the distribution as to give the Detroit territory all the equipment necessary for the proper handling of the output.

Although working in an executive capacity and having nothing to do with the detail of securing a certain number of cars for a certain factory, one of his duties was to see that no particular plant was favored and that the equipment was divided on a percentage basis where there was any question regarding distribution.

Ketcham's assignment to Detroit, according to a leading manufacturer, was in recognition of his efforts during the war when the demand for equipment developed a tendency on the part of some persons to secure an advantage over their competitors in the matter of railroad equipment.

QUEBEC SHOWS GAIN

MONTREAL, QUE., Oct. 4—The number of automobiles in the province of Quebec has grown greatly during the present year, and it is expected that by the end of 1919 there will be nearly 40,000 cars in the province, which will mean an increase of some 14,000 over the figures for 1918. Last year there were 26,338 cars in the province and for some five years the average increase has been about 5,000 cars a year, but in the first year after the war the demand for cars has trebled.

In the whole Dominion last year there were 269,753 cars, of which over 100,000 were in Ontario alone, and it is anticipated that this year the total Canadian figure will reach 350,000.

TORONTO, ONT., Oct. 4—From January 1, 1919, to August 31, 1919, approximately 120,000 passenger car permits and 9,500 motor truck permits have been issued by the Ontario Department of Highways. For the whole of last year there were issued 101,599 permits for passenger cars and 7,529 for trucks.

Limits Federal Aid To Intercounty Systems

WASHINGTON, Oct. 7—That Federal aid funds should hereafter be expended only upon roads which are included in an intercounty system of main highways is becoming a fixed policy in many states, despite the fact that the present road act does not require such use of the money. Pennsylvania, Virginia, Ohio, Indiana, Illinois, Wyoming and Washington are states which recently have practically decided to confine their Federal money to roads that count in well defined state systems.

NEW SMALL FARM TRACTOR

RICHMOND, VA., Oct. 6—The Parker Motor Plow Co., Inc., of this city has developed a small farm tractor fitted with a 2-cylinder 'V' type, air cooled engine, which can be used for turning, harrowing and cultivating. The air cooled engine has a rating of 9 h.p. The machine is designed to replace two horses. A line of implements suitable for the tractor has been developed, including a turning plow and side disking attachment, a cultivator with four or more shovels adjustable from 18 to 36 in., a mowing machine with 4 ft. blade, a two row corn planter, a two row cotton planter, a 4 ft. seed drill, and a two wheel car capable of carrying 700 lbs. The weight of the tractor with turn-plow attached is about 700 lbs. The engine is fitted with a belt pulley and may be used for driving a feed cutter, corn crusher, wood saw, cider mill, etc.

KITCHNER GETS NEW PLANT

KITCHENER, ONT., Oct. 4—The F. W. D. Auto Co. will commence construction of their new factory immediately.

ENTERS TRUCK FIELD

MINNEAPOLIS, MINN., Oct. 4—The Lenhart Motor Truck Co. has been incorporated with an authorized capitalization of $250,000. The officers are F. F. Lenhart, president; E. L. Leicher, vice president; F. A. Leicher, secretary, R. F. Lenhart, treasurer and manager. The directors are, F. F. Lenhart, E. L. Leicher, F. A. Leicher, R. F. Lenhart and O. L. Langworthy. F. F. Lenhart and R. F. Lenhart have previously owned and operated the Lenhart Wagon Works of Minneapolis.

WAR DEPT. MAY TRANSFER CARS

Bureau of Public Roads Allotted 20,519 Trucks and 7,000 Other Vehicles

WASHINGTON, Oct. 6—Motor vehicles and equipment may be turned over by the War Department to other government departments without charge, according to a ruling just made by Attorney General Palmer.

The free transfer of automobile equipment from the War Department to other branches of the government service is forbidden in an act passed July 19, but it is held that this act does not apply where highway improvement is the object.

This decision will allow the War Department to turn over the remaining 20,000 motor vehicles out of a total of 27,825, which were assigned to the Bureau of Public Roads, Department of Agriculture, transfer of which was stopped by the passage of the act of July 19.

The Bureau of Public Roads, Department of Agriculture, had been allotted 20,519 trucks and 7,000 other motor vehicles, of which but 6,700 trucks have been actually delivered and 14,950 others assigned but not delivered. Three thousand of the vehicles assigned to the Post Office Department were held up.

ERWIN PATENT PURCHASED

NEW YORK, Oct. 7—Harrison H. Boyce, of the Moto-Meter Co., Inc., will become sole owner of the fundamental Erwin patent, long recognized in the fire extinguisher field as basically covering automatic means of extinguishing fires under the engine hood of passenger cars, trucks and tractors. Boyce, it is reported, is contemplating forming a new company for the exploitation of this invention.

SEEKS EXPORT TRADE

MONTREAL, ONT., Oct. 4—J. O. Linteau, president of the Montreal Automobile Trade Association, Ltd., left today for New York, where he will leave aboard the Caronia for a few weeks' journey in Europe. He will visit the Grand International Automobile Exhibition, the fifteenth of its kind, which will be held in the Grand Palais in Paris. Linteau will take advantage of the opportunity to establish, if possible, more intimate commercial relationship between the allied nations and the metropolis of Canada. He also will visit England, Belgium, Switzerland and Italy.

ENTERS MAKERS' FIELD

BRADFORD, CONN., Oct. 7—The Consolidated Motor Car Co., has been incorporated in Delaware by Albert E. and Bert E. Lazaro, and Frank J. Kenny, of Bradford. The new firm will enter the manufacturing field. The capitalization is $750,000.

SEEK REVISION OF STEEL PRICE BASIS

Fabricators Ask Relief From Pittsburgh Basing—Before Trade Commission

WASHINGTON, Oct. 7—One of the greatest lawsuits in the history of the country looms as the result of a request to the Federal Trade Commission by several steel fabricating concerns to decide whether or not the present method of basing prices of raw steel on a single basing point at Pittsburgh is legal.

Forty-three concerns have notified the Federal Trade Commission that they oppose abolition of the present system of basing prices on raw steel throughout the United States on a single basing point at Pittsburgh. Thirty-six interests advocate a change of the system. This poll was taken as a result of the present controversy between the steel producing industry and the steel fabricating and manufacturing industries. Five steel consuming interests—the Western Association of Rolled Steel Consumers, the Birmingham Civic Association, the Joint Committee of Civic Organizations of Duluth, the Southern Association of Steel Fabricators and the State of Minnesota—asked the Federal Trade Commission to declare the present system in violation of the Clayton anti-trust law and the Federal Trade Commission law as constituting illegal price discrimination and an unfair method of competition in interstate commerce.

As direct parties to the issue, these interests have named the United States Steel Corporation and four of its subsidiaries, and the Inland Steel Co., the Interstate Iron & Steel Co., the Steel & Tube Co. and the Gulf States Steel Co.

Arguments of the applicants in favor of abolition of the single Pittsburgh base point include the following:

Under the existing system steel is sold throughout the United States at the prevailing price at Pittsburgh, plus a charge equivalent to the freight rate from Pittsburgh to the point to which the steel is delivered, regardless of the location of the mill selling the shipment and regardless of the actual freight charge involved. Thus, they point out, steel sold from mills in the Middle West is priced as though it were manufactured at Pittsburgh and transported from Pittsburgh to the Middle West purchaser.

Arguments opposing the application and against any change in the existing Pittsburgh basing system include:

Pittsburgh, producing some 70 per cent of all steel in the country, naturally and economically controls the market price of steel throughout the United States. Because, it is argued, no other one district produces sufficient to meet its own demands and the deficiency must be furnished by Pittsburgh. Mills at other points economically could not be expected to take a lower price than that which they can get, and with the over-balanced demand they can get up to the Pittsburgh price, because that is economically where they begin to meet a competitive supply. Pittsburgh, by its overproduction, therefore controls the market.

The War and Navy Departments and the Railroad Administration submitted statements favoring abolition of the system. Thirty-four concerns from all sections of the United States submitted letters favoring the application, while 43, of which 15 were from Pennsylvania, opposed the change.

Publication of this issue of Automotive Industries has been delayed by conditions over which the publishers have had no control. Further issues will be forthcoming as rapidly as they can be printed.

Newark Service Men Effect Organization

NEWARK, N. J., Oct. 3—Fifteen service managers met here last night and effected the temporary organization of the Newark Automotive Service Association, another link in the national organization move.

The men were brought together in the Automobile Club, once a fine old mansion on High street, Newark, by Al Rawson, Reo service manager in Newark. Rawson briefly told the object of the meeting and introduced President Ralph C. Rognon, of the recently organized Automotive Service Association of New York.

The temporary organization was formed by the election of the following officers:

President—Al Rawson, Reo Motor Car Co.

Vice-President—R. B. Van Order, Gordon B. Phillips Sales Co. (Hupmobile).

Secretary—F. A. Bringolf, Vesta Battery Service Co.

Treasurer—H. L. Wright, White Motor Co.

Board of Directors—L. S. Graham, Franklin Motor Car Co.; A. P. LaPointe, Rice-MacRae Motor Truck Co.; M. H. Yost, Barter-Oppenheim Co.; H. Burtfeldt, Herman Bartsch Automotive Co.; F. C. Worth, International Motor, and C. H. Darmstadt, Elgin Six.

Tank Battalions For National Guard Units

WASHINGTON, Oct. 7—Four light tank battalions will be included in the War Department plans for the organization of the National Guard, according to information made public by the War Department. It was also stated that there are several tanks available. There will be one battalion to each corps or four divisions of the guard. Each battalion will comprise three companies of twenty-five tanks each.

THOUSANDS SEEKING HOMES IN DETROIT

With Housing Situation Acute and 75,000 Increase Since April, Labor Is Scarce

DETROIT, Oct. 7—With Detroit's homeless quartered in lodge halls and semi-public and private buildings, with every available house or structure in use and hundreds still forced to seek shelter wherever possible, the housing situation here has become so grave Mayor Couzens last night called a mass meeting of citizens for discussion of plans to relieve the emergency.

The steady inflow of employes being brought here by the automobile and other industries has increased the city's population 33,000 in employes alone since April, who, with their families, are said to figure a total of approximately 75,000 souls on the basis of estimate used in the compilation of city directories. The average weekly increase of employes alone of 2,000 since April continues, and yet there is a complaint of lack of labor.

Every house in Detroit is crowded. In many instances health and sanitary regulations are being cast aside in order to give shelter to homeless persons, and in frequent cases four and five persons are occupying a single room. Hotels of every character are jammed, and the sight of baggage-laden visitors scurrying from one to another, only to be disappointed, is frequent. The mass meeting, at which a remedy will be sought, will be held under the auspices of the real estate men and bankers and financiers, when an immense housing plan is expected to be evolved.

CORRECTION

A recent description of the National car, in Automotive Industries, incorrectly gave the name of the carbureter used as standard equipment. It should have been Rayfield, that being the equipment now used.

FARRELL IS TREASURER

JACKSON, MICH., Oct. 7—The Briscoe Motor Corp. has elected J. Fletcher Farrell, treasurer of the Sinclair Oil Corp., a director of the company.

FORM FIRE ENGINE COMPANY

INDIANAPOLIS, Oct. 6—The Stutz High Duty Fire Engine Co. is building a new plant on North Capitol Avenue. The contract calls for its completion Nov. 1. Officials of the company are Harry C. Stutz, formerly president of the Stutz Motor Car Co.; Frank Wheeler, of the Wheeler-Schebler Co.; A. C. Macklenberg, formerly of the South Bend Fire Engine Co.; Edward Sourbier, county treasurer, and Martin Hugg, a local attorney. The company now has on view at the Chas. Stutz Sales Co. a combination hose and chemical wagon, 500-gallon pump capacity, that lists at $9,500.

$6,000,000 FIRM TO BUILD WHITE CAR

Lafayette Motors Co. Name of New Concern—Charles W. Nash President

INDIANAPOLIS, Oct. 8—The new company formed by D. McCall White recently, to manufacture a high quality passenger car, will be known as the Lafayette Motors Co. Indianapolis has been chosen as its manufacturing and distribution center because of the grouping of motor industry facilities there.

Charles W. Nash, of Kenosha, Wis., president of the Nash Motors Co., is president of the Lafayette Motors Co. D. McCall White, James J. Storrow, of Boston, chairman of the board of directors, and Earle C. Howard, formerly general sales manager of the Cadillac Motor Car Co., are the vice-presidents. Frederick W. Allen, of New York, is associated with the company as director. It is understood that Nash's association with the company will be largely in an advisory capacity, with Vice-Presidents Howard and White in active charge.

D. McCall White has designed the new car, which is expected to be completed this month and to be ready for exhibition in January.

The Lafayette Motors Co. will be capitalized with outstanding stock as follows: $4,000,000 (40,000 shares non-voting cumulative preferred stock, at $100 par, out of total authorized issue of 60,000 shares, and 40,000 shares of common stock of no par value, this sum being the present authorized issue. Apart from the shares secured by purchasers of preferred stock, the common stock will be held by Charles W. Nash, D. McCall White, Earle C. Howard and Lee, Higginson & Co., Boston.

The company has purchased a modern three-story factory building in Indianapolis, 500x54, equipped with up-to-date machinery. The factory site contains about 25 acres, affording sufficient space for extensions.

Ohio Trailer Co. To Make Passenger Car

CLEVELAND, Oct. 6—The Ohio Trailer Co. has decided to go into the manufacture of passenger cars. At the same time it was decided to increase the capital stock from $300,000 to $1,000,000 and to change the name of the company to The Ohio Motor Vehicle Co. A charter will be applied for under Ohio laws.

W. E. Ferris, the secretary, said that the company enjoyed big business during the war and that to handle orders the plant facilities had been increased about 300 per cent. Now that the plant is back to normal a large part of it is no longer used for making trailers. This brought about the decision to expand.

"We expect to manufacture a six-cylinder car to sell for about $3,000. We hope to be in production about Jan. 1," he said. "We will buy the major units of the car and will manufacture the remaining parts in our factory. We also will continue the making of trailers."

Charles A. Riegler is president of the company; W. E. Ferris, secretary and treasurer, and G. E. Dunstan, J. A. Burk and E. D. Lattimer, with the officers, make up the board of directors.

Pierce-Arrow Denies Rumor of Merger

NEW YORK, Oct. 7—Rumors of control of the Pierce-Arrow Motor Car Co. by the General Motors Corp., and that the new interests intended to produce a small medium-priced car, have been denied by John C. Jay, Jr., president of the Pierce-Arrow.

He said: "The directors and officers of the Pierce-Arrow Motor Car Co. have no knowledge of any change in the control of the company, nor of the purchase on the open market of the controlling interest in this stock by any other automobile company.

"There are absolutely no plans in contemplation involving the production of a small, medium priced car. The Pierce Co. will continue to build a line of product of the highest quality, and of the same type on which its reputation and success has been established."

Plan To Discontinue Making of Simplex

NEW YORK, Oct. 4—Manufacture of the Simplex automobile will be discontinued by the Wright-Martin Aircraft Corp., according to a recent announcement. The instability of the market for high-priced cars was said to be the reason. It was decided that the manufacture of motor trucks would be more profitable to the stockholders.

The aeronautical corporation will continue to operate the Simplex service station on Long Island. There are 600 Simplex cars now out and about one car a day is received at the service station for overhauling.

WIRE WHEEL DIVIDENDS

The Wire Wheel Corp. of America of New York has declared a dividend of 1 per cent on account of accrued dividends. The accumulated dividends, which will amount to 16 per cent on Oct. 1 will be paid off at the rate of 1 per cent per month, according to an announcement of the directors.

YELLOW CABS ABROAD

CHICAGO, Oct. 7—"Yellow cabs," the Chicago taxicab service which is noted throughout the United States as one of the most efficient and economical public vehicle systems in the country, are shortly to make their appearance in England. An order for 150 of these cabs was received this week by the Shaw Mfg. Co., builders of the machines, from an English firm. The Shaw concern has also received an order for a number of touring cars from Barcelona, Spain.

Goodyear Calls In $15,000,000 War Stock

AKRON, O., Oct. 6—The Goodyear Tire & Rubber Co. has called in its entire $15,000,000 second preferred stock, issued a year and a half ago as part of the war financing program. The stock will be taken up Nov. 1 at 105 plus 2 per cent quarterly dividend payable on that date. Under the conditions named at the time of issuance, the stock, which paid 8 per cent, was callable on or before February, 1921, at 105, on or before February, 1924, at 110, and on or before 1927, at 115.

The Goodyear company has an authorized capital of $100,000,000, of which $50,000,000 is to be common, $25,000,000 first preferred and $25,000,000 second preferred. Of this, however, only about $20,000,000 common, $23,000,000 first preferred and the present issue under discussion of $15,000,000 second preferred are outstanding.

Dayton Metal Plant Will Be Enlarged

DAYTON, OHIO, Oct. 8—The Dayton Metal Products Co. is about to resume manufacturing on an extensive scale. Its capital has been increased from $200,000 to $6,000,000. The stock in the new corporation consists of 600,000 shares, par value $100 a share. This company recently sold its plant to the Domestic Engineering Co. During the war the company turned its plant over exclusively to the manufacture of airplane parts and munitions.

H. E. Talbott is president and A. B. Hilton secretary of the company. It will be several weeks before manufacture will commence.

Rubber Co. Plans To Erect New Homes

RACINE, WIS., Oct. 6—The Racine Rubber Co., Racine, Wis., western division of the Ajax Rubber Co., New York and Trenton, N. J., has purchased 60 acres of land near its factory, upon which it will erect 500 dwellings to be sold to or leased to employes, thus relieving an acute shortage of housing accommodations in Racine. Two hundred dwellings are to be ready for occupancy by Dec. 15. The investment will be in excess of $1,500,000. The undertaking is expected to make less difficult the procurement of adequate forces to man the present Racine factory and a large addition which will be erected during the fall and winter months, work being rushed.

WILL BUILD NEW SIX

NORTH TONAWANDA, N. Y., Oct. 8—The Herschell Spillman Motor Co. of this city will begin at once the manufacture of a six cylinder engine which has been under consideration by this company for some time. Work will begin immediately on additions to the plant to care for this work. It is planned that deliveries of the engines will begin soon after the first of the year.

Gray & Davis Get Foreign Agent in French Eyquem Co.

BOSTON, Oct. 7—Sale on the European continent of the Gray & Davis automotive electrical equipment has been granted exclusively to the Eyquem Co., of France, according to an announcement here to-day by Gray & Davis, Inc.

The American company receives stock interest and representation on the directorate of the French concern. Ultimate plans call for the manufacture of all or a part of the equipment in France, but due to present manufacturing difficulties in Europe the equipment will be shipped from the plants here.

Service stations are being established in this country for the new Gray & Davis house lighting plants, the manufacture of which has just been commenced, so that the company's agents may act as distributers.

Trucks Help Farmers On 5,000 Mile Tour

MILWAUKEE, WIS., Oct 8—The 5,000 mile truck development tour, conducted by the National Association of Motor Truck Sales Managers, ended here this week. Sixty-five manufacturers are represented in the organization. The tour was the first effort by the association to bring together the truck manufacturers.

On the tour, the trucks went on farms and hauled produce over plowed fields, hooked up corn shellers, threshers and silage cutters, and carried livestock to cities to demonstrate the wide use of motor trucks on the farm as a labor economizer. The 10,000 ft. of motion pictures taken on the trip will be shown before agricultural societies in all parts of the United States and special lectures will spread the message of "have a motor-truck on your farm."

EXPORTS AUTOMOTIVE EQUIPMENT

NEW YORK, Oct. 7—An automotive export department has been added by Wonham, Bates & Goode, Inc., a New York exporting organization which has twenty-five branches in different parts of the world.

MILAN USES ELECTRICS

WASHINGTON, Oct. 7.—The shortage of gasoline during the war has greatly increased the use of electric vehicles in Milan, especially for heavy trucking, states a Commerce Report. Although under normal conditions gasoline will not continue at the present price of $1 a gallon, it will always be high in Italy and electricity low.

There is one electric garage in Milan (address of which can be obtained from the Bureau of Foreign and Domestic Commerce or its district or co-operative offices by referring to File No. 40723) that would like to form a combination with some American concern manufacturing electric trucks. This company operates electric buses for all the hotels and a regular express-truck service between Milan and Bergamo. It is organizing a 3,000,000 lire corporation to manufacture and operate electric vehicles.

FOREIGN TRADE OPPORTUNITIES

WASHINGTON, Oct. 8—The Bureau of Foreign and Domestic Commerce, Department of Commerce has received requests for automobiles or parts agencies of business from individuals and companies in foreign countries. These are listed below. For further information address the Bureau of Foreign and Domestic Commerce and specify the Foreign Trade Opportunity number.

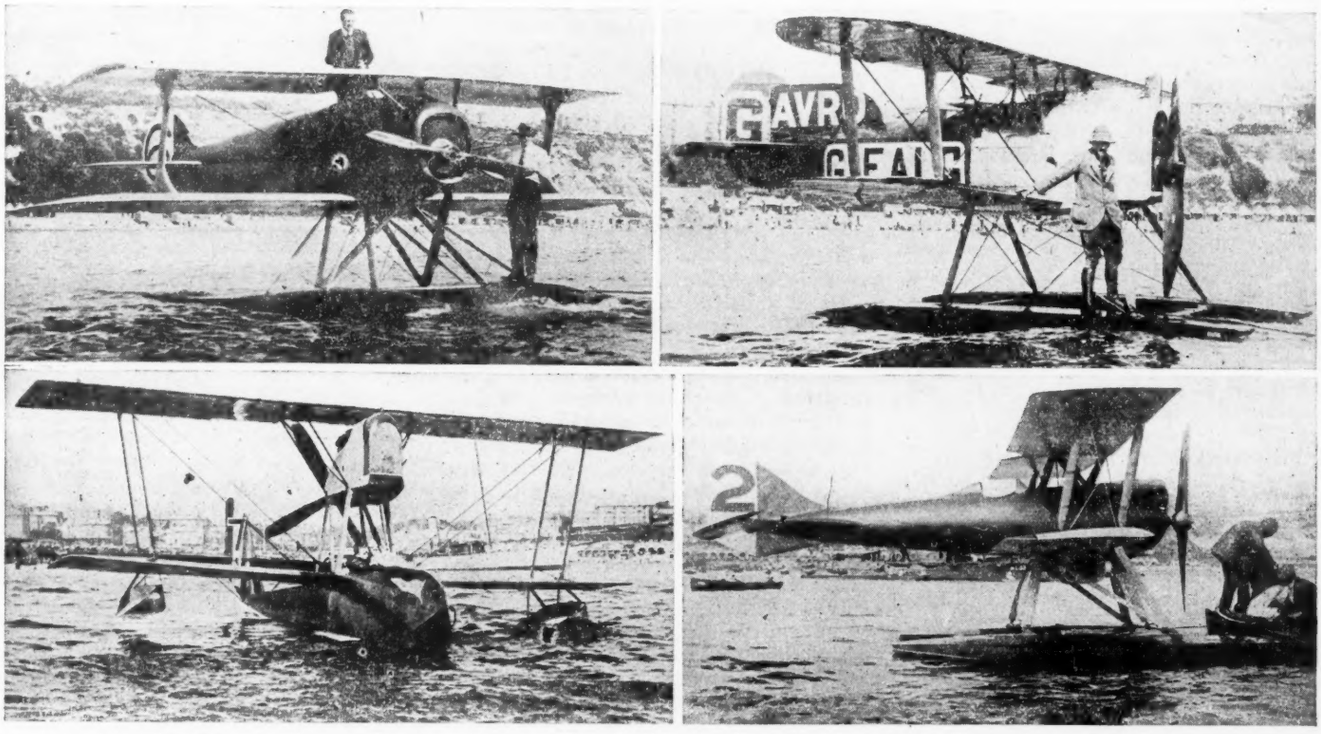
The sole agency in Czecho-Slovakia is desired by a firm in that country for the sale of passenger automobile cars and motor trucks. It is stated that he can sell about twenty-five large 50-hp. cars and about forty small cars of 18 to 25 hp. monthly. Correspondence may be in English. References. 30764.

Guadeloupe—A tractor for use upon a sugar estate where the ground is very hard. Correspondence should be in French. References. 30775. Trucks of about two tons. They will be required to make a daily run of at least 60 miles, climb 20 miles of hills of a steep grade on a macadam road. Tires should be very strong. Quotations should be given c. i. f. Guadeloupe. Payment by draft. References. 30781.

BIG ROAMER CAR ORDER

KALAMAZOO, MICH., Oct. 6—The Barley Motor Car Co. has received an order from William Cole & Sons, of London, England, for $1,600,500 worth of automobiles. The order calls for 366 Roamer cars of various models. The first shipments go forward this month.

Models of European Seaplane Construction



Many European models of seaplanes, unlike those of American manufacture, were shown at the recent International Seaplane Meet at Bournemouth, England. Above and to the left is shown a Spad (French) while underneath it is the Italian Savoia. The Avro in the upper right is British, while below it is shown a Nieuport (French)

CIVILIAN ENGINEERS TO AID WAR BOARD

Automotive Industries to Co-Operate with Government in Developing Engines of War

NEW YORK, Oct. 4—The combined engineering talent of the automotive industries of the United States will in the future co-operate with the government in the development of new and improved engines of warfare, a committee of automotive engineers sitting with the Technical Staff of the Ordnance Department in discussions concerning the design of all motor equipment material, particularly tanks, tractors and track-layer gun mounts of every description.

The new alignment of civilian and military experts is due to the efforts of Gen. C. C. Williams, chief of the Ordnance Department, who requested the Society of Automotive Engineers to appoint a board for active work with the War Department.

Prior to the war there was no organized co-operation between military and civilian experts, with a loss to the government of much valuable technical knowledge and experience. Under the new system the efforts of the Ordnance Department will incorporate the fruits of the combined laborers of the entire American automotive industry.

The first meeting of the newly organized board of civilian engineers was recently held at Washington, D. C., consisting of H. W. Alden, Timken-Detroit Axle Co., chairman; W. G. Wall, National Motor Car & Vehicle Corp.; J. G. Vincent, Packard Motor Car Co.; Dent Parrett, Parrett Tractor Co.; C. F. Kettering, Delco Co.; George M. Dunham, former president of the S. A. E. and consulting engineer; Charles M. Manly, president of the S. A. E., and Coker F. Clarkson, manager of the S. A. E.

Members of the technical staff of the Ordnance Department who met with the civilian engineers, in addition to General C. C. Williams, chief of ordnance, were Col. C. L. H. Ruggles, Col. L. B. Moody and Col. J. B. Dilliard.

It is planned to hold meetings of the combined board every two months to go over new designs of the Ordnance Department and to submit suggestions for corrections and improvement.

FORM NEW HEATER COMPANY

YOUNGSTOWN, OHIO, Oct. 6—The Eureka Accessory Co., of 464 Dollar Bank Building, has been organized here for the manufacture of automobile accessories. Its first product is a heater to be installed in cars, that is said to utilize the exhaust heat.

DEVELOP NEW TRACTOR

QUINCY, ILL., Oct. 4—It is understood that the Dayton-Dowd Co. soon will increase its line of tractors with an intermediate size. The new model, although not radical in design, embodies numerous features in the application of power which have been developed by the company's experience in the tractor field. With the addition of the new model, the company is prepared to meet the demand for large and small farm tractors for a variety of work.

Dealers in Spokane Plan Another Show

SPOKANE, WASH., Oct. 6—Dealers here are planning another show to be held Jan. 21-25. Headquarters will be at the Davenport Hotel. The first progressive automotive show, held last January, is still talked about in automotive circles here. The dealers plan to make it better than ever this year.

Stephens Rubber Co. Enters Tire Field

KANSAS CITY, MO., Oct. 7—Cord and fabric tires and inner tubes will be made here by the A. J. Stephens Rubber Co. After outgrowing two plants in the manufacture of automotive fabric products, this firm recently increased its capital stock to $1,500,000, and prepared to embark in the tire manufacturing business.

The expansion into tire and tube making will increase the number of employees to between 500 and 600. The company's production of blow-out patches has reached 3,000,000 annually, and the company has recently developed an annual output of 2,000,000 fan belts. The company began in 1916 with six employees.

STANDARD PLANS EXPANSION

CLEVELAND, O., Oct. 6—Capital stock of The Standard Tire Co., at Willoughby, is to be increased to $1,500,000 to enlarge the daily output of the plant. Stockholders will meet Nov. 3 to vote on the recommendations of the directors.

The company's capital stock is $350,000, and the directors propose to give the stockholders an opportunity to subscribe for $175,000 of common stock and $175,000 of preferred with a value of $100 a share.

BOSCH PRESIDENT ABROAD

NEW YORK, Oct. 7—Arthur T. Murray, president of the American Bosch Magneto Corp., left last week for a trip abroad, to investigate the export field as it applies to the Bosch products. Accompanying Murray is G. J. Lang, assistant to the president. The tour includes a visit to England, France, Belgium, Switzerland and Italy. It is expected that it will take at least three months to complete the investigation.

CANADIAN FORD DIVIDEND

WINDSOR, ONT., Oct. 4—Directors of Ford Motor Co., of Canada, Ltd., today declared a ten percent cash dividend on the company's outstanding $7,000,000 of stock. The dividend, payable immediately to stock of record September 29, is the fourth declared so far this year.

U. S. CHAMBER URGES BUDGET FOR NATION

Widespread Economy for All Government Bureaus Seen in Proposed Measure

WASHINGTON, Oct. 7—The establishment of a National Budget for the Government of the United States is advocated by the United States Chamber of Commerce at this time when the budget committee of the House of Representatives is starting its hearings on the subject.

It is expected that through the budget system, which would provide for the concentration of expenditures and centralization of responsibility, wide spread economy can be effected for all government bureaus.

The Chamber of Commerce has held referendums on this subject among its members who were repeatedly in practically unanimous favor of the national budget. The Chamber does not offer a bill, but asks that the principles of Chairman Charles Good of the House Committee be included in any bill drawn up. These principles would provide for submission by department heads to the President once each year the detailed expenditures for the fiscal year just closed, appropriations for the year in progress, estimates of expenditures for needs for the year to ensue, and such other information as he may require. The President by a special committee will also secure information as to the condition of the treasury, the revenues and expenditures of the Government for the year closed and for a series of years preceding, the fixed charges, appropriations and estimated expenditures for the year in progress and provisions for meeting revenue and expenditure requirements for the year to ensue. This information in turn would be transmitted to Congress by the President with analysis and explanations. Congress in turn would amend its rules to provide for a single committee in each house to have jurisdiction over all revenue and expenditure proposals, to receive and treat the budgets, and to prepare the necessary bills and reports.

Private Company May Operate Airmail Line

NEW YORK, N. Y., Oct. 7—A private company may get the contract to operate an air delivery line between Havana, Cuba, and Key West, Fla. It was announced recently that Otto Praeger, Second Assistant Postmaster General, had failed in the attempt to arrange a government air mail route between these two ports.

RUBBER COMPANY CHANGES NAME

MINNEAPOLIS, MINN., Oct. 6—The name of the Empire Tire & Rubber Co., manufactruers and distributors of automotive equipment, has been changed to the McKay-Grubb Rubber Co.

August Shows Increase In Automotive Exports

1919—	Cars	Value	Trucks	Value	Parts
August	6,283	$6,855,277	1,250	$2,537,812	$3,193,431
July	4,679	4,975,446	905	2,173,303	2,776,150
1918—					
August	2,710	2,818,259	909	2,337,904	3,072,756

WASHINGTON, Oct. 7—August, the second month of the government fiscal year 1920, indicates a reawakening of our automotive export trade on a peace-time basis. July totals were satisfactory, but those of August leave them far behind, especially in the case of passenger cars. The gain is still greater in comparison with the exports during August, 1918.

The increase is not so apparent in trucks and parts. To some extent this is accounted for by the fact that, throughout the war, our exports of these were not adversely affected as in the case of the passenger car. Trucks were needed in the fighting line and the cars available required constant overhauling and replacements to maintain them in operating condition.

Turning to our exports to individual countries, the August totals indicate that we are shipping cars in relatively large numbers to Denmark and Norway, countries with which we had practically no wartime automotive trade. We are also doing good business with Australasia, British South Africa, British India and the Dutch East Indies.

Our export trade with the Latin American Republics is fully maintained and is considerably better than at this period last year.

Although during the month of August we shipped 404 passenger cars valued at $456,927 to the United Kingdom, we had not then reaped any benefit from the removal of export restrictions by the British. As the embargo on automotive imports was abolished in September, it is reasonable to expect that our shipments during that and following months will increase considerably.

The items now included under the head of "other countries" will be analyzed in a later issue of Automotive Industries. They possess interest, as this compilation may show developments in Japan, China and other countries for which the individual records are not available at this time.

Exports of Automotive Equipment for August, Seven Previous Months, and Eight Months Ending August, 1919

	1918		1919		1918		1919	
	No.	Value	No.	Value	No.	Value	No.	Value
Airplanes	8	$ 175,100	....	.....	15	$ 219,755	11	$ 85,500
Airplane parts	....	1,816,726	....	$ 3,973	....	9,260,341	....	3,093,358
Commercial cars	909	2,337,904	1,250	2,537,812	6,417	16,043,139	9,675	23,307,364
Motorcycles	776	186,326	2,012	548,163	7,028	1,638,693	14,279	3,848,452
Passenger cars	2,710	2,818,259	6,283	6,855,277	28,743	27,023,315	37,908	41,985,322
Parts, not including engines and tires	....	3,072,756	....	319,343	....	22,106,375	....	25,833,740

Month of August, and Eight Months Ending August, 1919

	1918		1919		1918		1919	
Engines	No.	Value	No.	Value	No.	Value	No.	Value
Automobile, gas	1,935	$ 233,115	3,053	$ 467,819	21,751	$2,850,259	18,655	$2,928,549
Marine, gas	488	438,531	1,101	388,005	3,614	1,848,396	7,957	3,471,735
Stationary, gas	1,598	253,138	2,042	309,466	18,569	2,217,732	16,323	2,470,917
Tractor, gas	1,189	1,763,586	1,655	1,544,193	17,388	17,843,692	14,616	14,765,335
Total	5,210	$2,688,370	7,851	$2,709,483	61,322	$24,760,079	57,551	$23,636,536

Exports by Countries for August, and Eight Months Ending August, 1919

	Cars		Trucks		Cars		Trucks	
	No.	Value	No.	Value	No.	Value	No.	Value
Denmark	265	$ 358,815	....	.....	1,672	$1,922,478	....	.....
France	42	87,631	148	$ 622,634	420	1,411,519	2,571	$11,087,311
Norway	381	334,158	....	.....	1,089	1,366,960	....	.....
Russia in Europe	1	600	....	.....	1	600	....	.....
Spain	273	301,934	....	.....	812	950,339	....	.....
United Kingdom	404	456,927	7	16,788	1,469	1,656,335	71	140,197
Canada	688	854,452	242	389,104	5,806	5,813,333	1,247	1,888,005
Mexico	215	157,283	....	.....	1,786	1,458,212	....	.....
Cuba	180	181,161	55	117,789	1,505	1,758,527	534	1,165,062
Argentine	187	225,073	24	24,966	1,307	1,671,148	99	195,047
Chile	3	4,741	....	.....	394	610,883	....	.....
Uruguay	72	118,551	....	.....	1,184	1,175,446	....	.....
British India	206	239,482	....	.....	1,160	1,296,387	....	.....
Dutch East Indies	214	268,363	....	.....	1,522	1,980,098	....	.....
Russia in Asia	11	24,200	....	.....	49	52,145	5	5,050
Australia	311	341,177	....	.....	2,156	2,171,836	....	.....
New Zealand	287	323,265	....	.....	1,728	1,908,391	....	.....
Philippine Is.	159	289,635	....	.....	1,696	1,930,986	....	.....
Br. So. Africa	368	429,409	....	.....	1,537	1,838,463	....	.....
Other countries	2,016	1,858,420	774	1,366,531	10,615	11,020,736	5,148	8,826,692
Total	6,283	$6,855,277	1,250	$2,537,812	37,908	$41,985,322	9,675	$23,307,364

Ballot Car Makes Gaillon Record

PARIS (Staff Correspondence)—Rene Thomas, in his Indianapolis Ballot car, recaptured for France the Gaillon Hill climb record.

This record was made in 1913 by Erle, driving a 1,250½ cu. in. Benz. The German car had covered the kilometer in 22 seconds. Several attempts since then were futile, including a recent attempt by Rene Thomas, in which he was able to tie the German record. It was then that Thomas, confident of his ability to lower the German mark, announced that he would again attempt the climb.

In his second attempt Thomas covered the kilometer in 21 3/5 seconds, clipping two-fifths second off the Benz time. In order to accomplish this feat Thomas drove his Ballot at a rate of 103.17 m. p. h.

Hawaiian Motor Merchandiser Here

NEW YORK, Oct. 6—To facilitate shipment of his company's allotment of cars and automotive equipment from American manufactories, J. K. McAlpine, general manager of the Pond Co., Ltd., of Honolulu, is on a visit to this country. He visited factories of the Studebaker, Maxwell and Chalmers cars, which his company distributes.

$1,000,000 Car Top Company Formed

CLEVELAND—The General Top Co., with a capitalization of $1,000,000, recently organized here, gives promise of coming at once into a place of unusual importance in the automotive industry. It is headed by men whose names and experience foreshadow for their products speedy recognition.

The name of Christian Girl, president of the Standard Parts Co., is connected with the enterprise as vice-president, and C. R. Norton, for many years general sales manager of the Packard Motor Car Co., of Detroit, is mentioned as its president. T. E. Borton, of Borton & Borton, a leading banking and investment house of Cleveland, will be treasurer. Norman Elliott, of the former Consolidated Top Co., is secretary.

The product of the General Top Co. is known as the Artcraft Top.

RANGER MAKERS ADDING

HOUSTON, TEX., Oct. 4—The Southern Motor Manufacturing Association, Ltd., manufacturers of Ranger automobiles, trucks, tractors and trailers, has commenced construction of additions to its plant on the fifty-acre tract given the company by the city.

Atterbury Co. Expands To Meet Trade Demand

BUFFALO, N. Y., Oct. 6—Directors of the Atterbury Motor Car Co. have voted to build large additions to their present factories. The proposed additions will almost double the present capacity.

PACKARD OFFICIAL DEAD

DETROIT, Oct. 8—Philip Hamilton McMillan, secretary and treasurer of the Packard Motor Car Co., died suddenly Oct. 4. Heart trouble was the cause of death. He had been in poor health for several months, but was able to attend to his business affairs until a few hours before death. Besides his connection with the Packard company he was one of the publishers of the Detroit Free Press and a director of the First & Old Detroit National Bank, the Detroit Savings Bank, Detroit Seamless Steel Tube Co., the Standard Accident Insurance Co., Michigan Fire & Marine Insurance Co., Cass Farm Land Co. and the Blackstone Land Co. He was 47 years old.

George L. Bury, formerly manager of the Packard Motor Car Co. of Chicago, has been recalled to Detroit by the Packard factory and will hereafter fill the position of general distribution manager there. Bury had been in Chicago only a few months, taking over the management when the Packard factory purchased the distribution business of the old Chicago Packard organization and converted it into a factory branch. Charles G. Embleton, general distribution manager for the company, has succeeded Mr. Bury as general manager at Chicago. Embleton has been with the Packard Motor Car Co. for twelve years, conducting branches at Springfield, Mass.; Hartford and New London, Conn.; Newark, N. J., and Brooklyn, N. Y., and was territorial manager for the Packard for New York.

C. M. Cornog, formerly connected with the Standard Auto Parts Co. of Cleveland, is now located in Philadelphia as district manager for the Standard Woven Fabric Co., manufacturers of Multibestos, brake and clutch lining.

John W. Lewis, formerly with the Champion Ignition Co., is now representing the Standard Woven Fabric Co. in Michigan and western Ohio.

F. C. Kehr, for three and one-half years manager of the truck department of the Kissel Motor Car Co., has resigned to take up other work.

J. A. Haskell, formerly of Chicago and Des Moines and for some time past connected with the sales department of the Grant Motor Car Corp., Cleveland, has been made assistant general sales manager.

J. E. Nield has resigned as assistant general manager of the Trego Motors Co. to become associated in the manufacturing business of the Buffalo Body Corp.

W. B. Condit, formerly of the engineering staff of the Gramm-Bernstein Motor Truck Co., Lima, O., has accepted the position of chief draftsman for the Nelson Motor Truck Co., Saginaw, Michigan.

C. P. Wilson, for several years assistant general manager for the Norma Company of America, New York, has been elected vice president of the company. W. M. Nones continues as president and treasurer, in executive charge of the company's affairs.

Men of the Industry

Changes in Personnel and Position

Mark A. Smith, for years lubrication engineer of the Atchison Adhesive Graphite Co., has been added to the staff of the Midwest Engine Co. at Indianapolis, Ind. Smith recently returned from overseas, where he served as a lieutenant of Marines, and was gassed in the Argonne fighting.

E. T. Boland, for 15 years connected with the Kissel Motor Car Co., Hartford, Wis., has resigned to accept the position of works manager of the Topp-Stewart Tractor Co. at Clintonville, Wis.

Alfred Reeke, head of the Alfred Reeke Co., 455-459 Broadway, Milwaukee, distributer of Nash passenger cars and trucks, has been appointed member of the transportation committee of the Milwaukee Association of Commerce, as representative of the motor truck industry. The appointment is considered a deserved recognition by the association of the importance of the commercial vehicle in modern transportation and the growth of the "Ship by Truck" movement.

Jay Dewey has been appointed director of sales for the Lexington Minute-Man Six. Mr. Dewey was formerly district sales manager for the Lexington. For three years he served as manager of the Lexington branch at Kansas City, returning to the home office of the company to become district sales manager.

D. E. Anderson, who was one of the designers of the Essex car, has severed his connections with the Hudson Motor Car Co. and has been appointed chief engineer of the Sunnyhome Electric Co. division of the General Motors Corp. He is now getting ready for production a fully automatic farm lighting unit.

H. S. Ketcham, formerly with the Chevrolet Motor Co., has accepted a position as sales manager of The Consolidated Automobile Co., Dayton, O., distributer of Kissel and Chevrolet cars and trucks. Ketcham will have charge of the distribution throughout Southern Ohio, Northern Kentucky, Southeastern Indiana and Western West Virginia.

OPENS LARGER PLANT

JERSEY CITY, N. J., Oct. 8—Edward V. Hartford, Inc., makers of the Hartford shock absorber, have answered the constantly increasing demand for Hartford products by moving into a new factory at West Side avenue and Carbon place. The executive offices will be moved to 35 Warrent street, corner of Church Street, New York.

OHIO PARTS MAKER DIES

COLUMBUS, OHIO, Oct. 6—John H. Reed, aged 49 years, superintendent of the Peters & Heron Co., makers here of many lines of automotive equipment, died recently from apoplexy. He was superintendent of the concern for the past three years.

Burton W. Newhall has been appointed general sales manager of the Tractor Division of the Dayton-Dowd Co. of Quincy, Ill., manufacturers of the Leader Tractor and Farm Machinery.

Harry E. Figgie has been made manager of sales of the Perfection Spring division of the Standard Parts Co., of Cleveland. He has been a sales engineer of the division and is well known in automotive circles. He has assumed his new duties.

J. B. Childe has been appointed general manager of the Perfection Spring division of the Standard Parts Co. He has been identified with the company since 1917 as general manager of the Canton spring and forge division. H. E. Clay, formerly plant manager of the Perfection spring unit, succeeds Childe as general manager in the Canton division.

Maj. Basil Y. Cockrell, of London, manager of the Selden truck interests in that city, recently came to the United States to visit the Selden factory at Rochester, N. Y. He will return to England for the Olympia Show at London early in November, where he has arranged a display of the company's products.

Sergeant Edw. W. Keefer, who was formerly Eastern traveling representative of The Bearings Co. of America, of Lancaster, Pa., has returned to his former position with The Bearings Co. of America. Keefer enlisted for service in May, 1917, and saw service in several major engagements in France with the 28th division.

J. H. Kelly, who for eight years was an executive in the production end of the Hudson organization in Detroit, has become an executive in the production department of the Jordan Motor Car Co. in Cleveland.

EAST PALESTINE RUBBER ELECTS DIRECTORS

EAST PALESTINE, OHIO, Oct. 7—The East Palestine Rubber Co. has elected the following board of directors: C. F. Adamson, J. F. Stoddard, J. H. Whittenberger, William G. Morris, C. F. Woods, S. B. McClure and P. H. Murphy, all East Palestine business men.

The officers of the company are C. F. Adamson, president and treasurer; S. B. McClure, vice-president; and J. F. Stoddard, secretary.

The company's new plant, which has been standing idle the past two years, will be put in operation immediately, it is announced.

Current News of Factories

Notes of New Plants—Old Ones Enlarged

WILLYS-MORROW GROWS

ELMIRA, N. Y., Oct. 7—Work on the Willys-Morrow plant in this city is being rushed. Erection of the drop-forge plant, 700 ft. in length, is progressing rapidly and plans are being made for the speedy construction of the four other buildings—chemical laboratory, heat treating plant, pickling plant and die factory.

The plant when complete is expected to give employment to 2,500 men.

RELIANCE CO. EXPANDS

APPLETON, WIS., Oct. 6—The Reliance Motor Truck Co., Appleton, Wis., manufacturer of the Reliance truck and Badger external gear-drive truck axles, is preparing to invest $100,000 in plant additions and new equipment to be better able to handle its business. The main addition will be four stories, 70x275 ft., and be used largely for machine work and assembling of axles. The total floor space will be more than doubled by the enlargement.

DUPLEX MARKETING SPRINKLER

LANSING, MICH., Oct. 4—The Duplex Motor Truck Co., of this city, is placing a motor sprinkler wagon on the market. The first completed machine has been presented to the city of Lansing. It has eliminated the work of six teams, while the overhead is comparatively nothing. The truck is equipped with a 1,000-gal. tank and can cover 60 miles of street daily. The tank was built in this city. The Duplex company is now organizing a separate department to handle sprinkler production.

EQUIPMENT FIRM FORMED

NEW YORK, Oct. 7—Victory Auto Trunk Co., Inc., has incorporated at $50,000 to manufacture trunks, bags, leather goods, automotive equipment and caps. The incorporators are: H. Alexander, H. J. Ries and A. Mayer, all of New York.

MERIDEN PLANT GROWS

MERIDEN, CONN., Oct. 7—The Cuno Engineering Corp. is to erect a new concrete and steel factory here. The structure will be modern in every respect and when completed will house an industry employing 200 hands.

It will be on Colony street with frontage on Lake street, and on the main line of the New York, New Haven & Hartford railroad. The firm makes electrical automotive appliances.

ENLARGE SAGINAW PLANT

SAGINAW, Oct. 4—Plans for quadrupling the working force and production of the local plant of the Michigan Crankshaft Co., a General Motors subsidiary, has been made by J. W. Wilford, of Lansing, manager of the crankshaft division. A new plant, 160x800 ft., will be elected and 800 men will be employed. Work on the new plant will begin within a week.

BROAD BROOK PLANT SOLD

HARTFORD, CONN., Oct. 7—The business and plant of the Broad Brook Co., Broad Brook, Conn., has been acquired by William Wiese & Co., of New York. Sixty per cent of the stock has already been secured. Automobile trimmings will be made exclusively. The business was established in 1847. Woolen cloths for men's clothing originally occupied the concern, but of late years considerable stock has been turned out for automobiles. The purchasers are said to have been in quest of the mills for some time past. Harry C. Brook, of Hartford, who has been connected with the works for many years, has been elected president and a member of the board of directors.

UNION HAS NEW PLANS

BAY CITY, MICH., Oct. 8—The Union Motor Truck Co. has selected a 42-acre site in the Riverside Park addition for its new plant. The construction work will commence soon on the main building, which is to be 100x500 ft. The company will also erect a steel foundry, 60x120 ft.

LITCHFIELD PUBLISHES BOOK

AKRON, O., Oct. 4—Under the title, "The Industrial Republic," a book from the pen of Paul W. Litchfield, vice-president and general manager of the Goodyear Tire & Rubber Co., has just come off the press. Litchfield discusses freely the labor and economic questions confronting the United States and suggests possible solutions for several problems of industry.

NEW CURTISS AGENCY

PORTLAND, ORE., Oct. 4—The Curtiss Aeroplane & Motor Corp. has established a new distributing agency for land machines and flying boats in the states of Washington, Oregon and Idaho. Chester G. Murphy, who is head of the new agency, has opened headquarters here. He will establish dealers in the three states and also have branch offices in Boise, Idaho, and Seattle Wash.

In addition to acting as distributer in this territory, Murphy plans to operate flying schools and passenger-carrying lines. He will also establish several landing fields in the near future.

NEW ELMIRA FACTORY

ELMIRA, N. Y., Oct. 7—Silverton Motor Co., Inc., has been incorporated here by A. J. Meyer, J. T. Osowski and G. Petzke, with capitalization of $40,000.

BROWN BODY CORP. NOW

CLEVELAND, Oct. 4—The Brown Auto Body Co. has incorporated a new company, to be known as the Brown Body Corp. It has purchased a site and will build two plant units, having a combined floor space of 100,000 sq. ft. The demand on the Brown Auto Body Co. for closed bodies, in addition to its special lines, has warranted it in incorporating for $1,000,000. The personnel of the corporation will remain the same, with Paul J. Brown as president; W. G. Schmunk, vice-president, and Carl Halle, secretary and treasurer.

NEW GOODYEAR FACTORY

REGINA, SASK., Oct. 6—The Goodyear Tire & Rubber Co. has announced intention of building a $75,000 plant here at once to serve Western headquarters.

CLUTCH COMPANY EXPANDS

SANDWICH, ONT., Oct. 6—A Detroit company manufacturing clutches for automobiles, trucks and tractors, has secured a site here and proposes to erect a branch plant. Building operations will not be commenced until next year.

ERECTS $100,000 FACTORY

OSHAWA, ONT., Oct. 6—Contract has been let for a factory building to cost $100,000 by the Gananoque Spring & Axle Co.

The General Motors of Canada, Ltd., has announced part of its extension policy. A new four-story plant, 400x80, with a capacity of 56 freight cars under roof, will be erected, so that inclement weather will not handicap shipping operations. An enameling plant, 300x80 ft., equipped with the most modern facilities, will also be erected.

TO BUILD HOMES FOR WORKERS

MUSKEGON, Oct. 4—The first attempt of a Muskegon company to build homes for workers is being made by the Continental Motors Corp., which will build a large apartment house at a cost of several hundred thousand dollars. It will be divided into flats to accommodate fifty families.

BRISCOE EXPANDING

JACKSON, MICH., Oct. 6—The Briscoe Motor Corp. plans the extension of its manufacturing capacity, and has sold 45,000 shares of new common stock to secure the necessary funds. Production is now running at 1,500 cars a month.

U. S. MAY BUY PLANT

WASHINGTON, Oct. 7—The purchase of the Curtiss-Elmwood plant of the Curtiss Aeroplane & Motor Corp. by the United States Government would be authorized by a bill introduced in Congress by Representative Julius Kahn. The bill provides for the purchase of the plant for $6,114,126.63. The Curtiss-Elmwood plant consists of 79 1-10 acres of land and numerous buildings, factories, warehouses and machine shops.

Calendar

SHOWS

Sept. 30-Oct 14—Dallas, Texas. Southwest Motor Show, Dallas Automobile and Accessory Dealers' Assn.

October—Ft. Dodge, Ia. Fall Motor Show, District Fair Grounds.

Oct. 6-11—Detroit, Mich. Closed Car Show, Arena Gardens. Detroit Auto Dealers' Assn. H. H. Shuart, Mgr.

Oct. 11-18—Pittsburgh, Pa. Fall Show.

Oct. 15—New York City. Opening of International Farm Tractor and Implement Exchange, Grand Central Palace.

Nov. 3-8—Chicago, Ill. Business Exhibit of Automotive Equipment Assn., Medinah Temple.

Nov. 16-23—New York Automobile Salon, Hotel Commodore.

January—New York. International Automobile Mfrs. Congress.

Jan. 3-10—New York, N. Y. Grand Central Palace, National Automobile Chamber of Commerce. S. A. Miles, Manager.

Jan. 3-10—New York City, Eighth Coast Artillery Armory, commercial cars and accessories.

Jan.17-24—Cleveland. Nineteenth Annual Automobile Show. Cleveland Automobile Mfrs. and Dealers' Assn., Wigmore Coliseum.

Jan. 24-31—Chicago, Ill. Coliseum, Cars; Drexel Pavilion, Trucks; National Automobile Chamber of Commerce. S. A. Miles, Manager.

Jan. 24-31 — Chicago. International Amphitheater, commercial cars and accessories.

Feb. 21-28—Ottawa, Ont. Motor Show.

Feb. 23-28—Louisville, Ky. Twelfth annual exhibition, Louisville Automobile Dealers' Assn., First Regiment Armory.

February—Chicago. International Automobile Mfrs. Congress.

February—Deadwood, S. D. Annual show, Deadwood Business Club. F. R. Baldwin, Manager.

FOREIGN SHOWS

Oct. 9-19—Paris. Grand Palais, International Automobile Mfrs. Congress.

Oct. 14-16—Ottawa, Ont., Can. Interprovincial Plowing Match and Tractor Demonstration.

November—Christchurch, N. Z. First National Motor Show.

Nov. 7-16—London. Olympia Motor Car Exhibition—Society of Motor Mfrs. and Trades.

Dec. 19-Jan. 4—International Aviation Exhibition, Paris, France.

December — Brussels. International Automobile Mfrs. Congress.

January — Glasgow, Scotland. Scottish Motor Exhibition.

February — Manchester, Eng. North of England Motor Exhibition.

Feb. 23-March 6—Birmingham, Eng. British Industries Fair.

March—London, Eng. Motor Boat, Marine and Stationary Engine Exhibition.

March—Adelaide, Australia. All Australian Exhibition of motor vehicles, airplanes, engines and automotive equipment.

April or May—London, Eng. Commercial Vehicles Exhibition, Olympia.

April 3-May 4—Buenos Aires. Exposition of U. S. manufactures.

AUTOMOTIVE SHOWS AT FAIRS

October—Columbia, S. C. Columbia Automobile Dealers' Assn.

Oct. 6-19—Dallas, Tex. Cars, Trucks and Tractors, Texas State Fair.

Oct. 20-25—Raleigh, N. C. Cars, trucks and tractors.

Oct. 22-27—Shreveport, La. Cars, trucks and tractors.

Oct. 27-31—Columbia, S. C. South Carolina State Fair Assn.

Nov. 3-8—Phoenix, Ariz. Tractor Demonstration, Arizona State Fair.

TRACTOR SHOWS

Oct. 14-17 — Evansville, Ind. Central States Tractor Sales Show. W. R. Heilman, Mgr.

Oct. 15—Ellensburg, Wash. Tractor demonstration in Charge of W. L. Davis, County Agricultural Agent.

Oct. 15-18—Charleston, W. Va. Tractor Demonstration, Kanawha County Fair.

Oct. 30—Yerington, Nev. Tractor demonstration. Lyon County Farm Bureau.

Nov. 22-29 — Jacksonville, Fla. Florida State Fair and Exposition. B. K. Hanafourde, Manager.

February — Kansas City, Mo. Fifth Annual Kansas City Tractor Club. Guy H. Hall, Manager.

Feb. 9-14—Wichita, Kan. Tractor and Farm Machinery, Forum, Wichita Thresher-Tractor Club.

CONTESTS

Oct. 11—Cincinnati, O. 300 mile Speedway race.

Oct. 11—Danbury, Conn. Dirt track event.

Nov. 2-3—El Paso, Texas. El Paso-Phoenix road race.

Nov. 27—Los Angeles, Cal. Ascot Speedway race.

Dec. 29—Los Angeles, Cal. Ascot Speedway race.

August, 1920 — Paris, France. Grand Prix Race, Sporting Commission, Automobile Club of France.

CONVENTIONS

Oct. 9-10 — Jackson, Miss. Second Annual Convention, Louisiana-Mississippi Assn.

Oct. 14-16 — Semi-Annual Meeting, American Gear Mfrs. Assn., Copley Plaza Hotel, Boston, Mass.

Oct. 14-17—Atlantic City, N. J. Twenty-fifth Annual Convention, Marlborough-Blenheim, National Hardware Association of the United States.

Oct. 15-17 — Chicago. Twenty-sixth annual convention of the National Implement and Vehicle Assn., Congress Hotel.

Oct. 16-17—New York. Business Conference in connection with Foreign Trade Convention of Amer. Mfrs. Export Assn.

Oct. 20—Atlantic City, N. J. Convention of business men called by Chamber of Commerce of U. S. to confer with foreign delegates.

Oct. 27-28—Santa Barbara, Cal. State Automobile Trade Assn., Southern Division.

Oct. 29—Washington, D. C. Annual Labor Conference provided by Peace Treaty.

November—London, Eng. Road Transport Congress and Exhibition.

Nov. 3-8—Chicago, Ill. Convention, Automotive Equipment Assn., Medinah Temple.

Nov. 7-8—Detroit. Meeting of National Assn. of Motor Truck Sales Managers, Hotel Statler.

Nov. 10—Detroit. Service Managers' Convention.

Dec. 3-5—Cleveland. Ohio Automobile Trade Assn., Annual Convention.

January, 1920—Washington. Pan-American conference.

Feb. 9-13—Louisville, Ky. Seventeenth Annual Convention American Road Builders' Assn., Tenth American Good Roads Congress and Eleventh National Good Roads Show.

May 15-20, 1920—San Francisco. Seventh National Foreign Trade Convention.

Wright-Martin and International Merged

NEW YORK, Oct. 4—Approval of the plan for merger with the International Motor Truck Corp., of the Wright-Martin Aircraft Corp., has been announced. The decision was made at a stockholders' meeting. The plan provides for the absorption of part of the assets of the Wright-Martin corporation by the International stockholders, the former retaining control of the aircraft business.

Three new members of the board of directors of the Wright-Martin company are James B. Clews, J. F. Prince and T. C. Curtis, Jr. They were elected to succeed T. F. Manville, H. J. Park and J. V. Alvord. Other directors were re-elected.

Montreal Firm Plans To Produce $600 Car

MONTREAL, Oct. 8—The P. Lyall & Sons Construction Co., Ltd., plans to enter the automobile manufacturing field with a car to retail at $600. The motor, now in the process of final perfection, is said to be unique in the small number of its parts, and in gas economy.

The motor is the creation of one of the Lyall mechanics. Recent tests are said to have established engine ability to drive the car an exceptionally long distance on a gallon of gasoline. The Lyall plant is being equipped to turn out 30,000 of these cars in 1920. A large business is being done in the manufacture of a patent chuck, used in the operation of lathes. This is another invention of the Lyall mechanic who developed the engine for their new car.

I. E. B. M. CO. TO MOVE

KENOSHA, WIS., Oct. 6—The International Earth Boring Machine Co., of Chicago, has decided to relocate its works at Kenosha, Wis., in order to be close to a large motor truck manufacturing center. The company manufactures a device for boring post holes which is combined with motor truck chasses for the use of telephone and telegraph corporations. The company has selected a site adjacent to the works of the Winther Motor Truck Co. at Kenosha, Wis., which has taken a large contract for the chasses to be equipped with the earth boring devices. It is unofficially stated that the American Telephone & Telegraph Co. has arranged to absorb practically the entire output of the post-hole trucks for an indefinite period.

$80,000 Worth of Equipment for Michigan Crankshaft

LANSING, MICH., Oct. 3—The Michigan Crank Shaft Co., a unit of the General Motors Corp., will install $80,000 worth of equipment. In addition to this sum, a separate appropriation for a new heating plant has been approved. The new equipment, which will be installed in an unoccupied portion of the plant, will permit an increased production of approximately 20 per cent. The company is doing work for the Olds, Chevrolet and Northway motors companies.

WILL MAKE NEW CAR

CLINTONVILLE, WIS., Oct. 6—The organization of a new corporation for the purpose of manufacturing passenger cars has been undertaken at Clintonville, Wis., which is the seat of the F. W. D. Auto Co. and the Topp-Stewart Tractor Co.

The proposed organization has arranged for a factory and assembling plant and intends to build a medium-priced car, purchasing the principal parts and units. Its initial field will be Wisconsin, Northern Illinois, Iowa, Eastern Minnesota and Upper Michigan. No further details were announced.